ORDER NO. SD83032419A6

Service Manual

Direct Drive Automatic Turntable System

SL-V5/(K)

[PA], [PE], [PC]

* The colors of this model include silver and black.
* The black type model is provided with (K) in the Service Manual.

Areas

* [PA] is available in far East PX.
* [PE] is available in European Military.
* [PC] is available in European Audio Club.

Please use this manual together with the service manual for Model No. SL-V5/(K) Order No. SD83022410C8.

CHANGES

■ REPLACEMENT PARTS LIST

Note:
Ⓚ—marked parts are used for black only, while
○ —marked parts are for silver type only.

Ref. No.	Change of Part No.		Part Name & Description	Per Set (Pcs.)	Remarks
	SL-V5/(K) (ORDER NO. SD83022410C8) →	SL-V5/(K) [PA], [PE], [PC]			
SWITCH					
S901	SFDSHXW225–2 [XA] ⚠	SFDSHXW225–2	Voltage selector	1	
POWER TRANSFORMER					
T1	SLT57DTE10E [EK, XL] ⚠	SLT57DT11E	Power Transformer	1	
	SLT57DT11E [XA] ⚠				
	SLT57DT9E [Other Areas] ⚠				
FUSES					
F1	XBA2C016TR0 [XA] ⚠	XBA2C016TR0	160mA, 250V	1	
F2	XBA2C06TR0 [XA] ⚠	XBA2C06TR0	630mA, 250V	1	
	XBA2C06TR0 [Other Areas] ⚠				
CABINET and CHASSIS PARTS					
2	SFDJHSC0491 [XL]	SFDJHSC04912	Socket, AC Power	1	
	SFDJHSC0498 [Other Areas]				
9	SFNNV05G01 [EK, XL]	SFNNV05P01 [PA, PE]	Name Plate	1	
	SFNNV05X01 [XA]				
	SFNNV05S01 [E, EC]	SFNNV05P02 [PC]	Name Plate	1	
	SFNNV05R01 [Other Areas]				
82	EPC–P24S	EPC–P28	Cartridge	1	
	EPS–24CS	EPS–28ES	Stylus	1	

Technics

Panasonic Tokyo
Matsushita Electric Industrial Co., Ltd.
1-2, 1-chome, Shibakoen, Minato-ku, Tokyo 105 Japan

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Ref. No.	Change of Part No.		Part Name & Description	Per Set (Pcs.)	Remarks
	SL-V5/(K) (ORDER NO. SD83022410C8)	→ SL-V5/(K) [PA], [PE], [PC]			
ACCESSORIES					
A1	SFNUV05G01 [EK]	SFNUV05P01	Instruction Book	1	
	SFNUV05R01 [EG]				
	SFNUV05F01 [EF]				
	SFNUV05i01 [Ei]				
	SFNUV05X01 [XA]				
	SFNUV05S01 [Other Areas]				
A4	RJA26Z [XL] ⚠	QFC1100	AC Cord	1	
	RJA43Z [EK] ⚠				
	QFC1103 [XA] ⚠				
	RJA20Z [Other Areas] ⚠				
PACKING PARTS					
P1	SFHPV05C01 [EF] ○	SFHPV05M01	Carton Box (Silver Type)	1	
	SFHPV05M01 [Other Areas] ○				
	SFHPV05C21 [EF] 🅚	SFHPV05M21	Carton Box (Black Type)	1	
	SFHPV05M21 [Other Areas] 🅚				

Printed in Japan
8330610 Ⓗ YW

ORDER NO. SD83022410C8

Service Manual

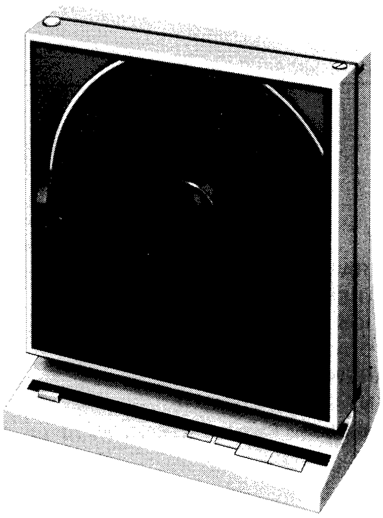
Direct Drive Automatic Turntable System

SL-V5

[E], [EK], [XL], [EG], [EB],
[EH], [EF], [Ei], [EC], [XA], [XM]

SL-V5(K)

[E], [EK], [XL], [EG], [EB],
[EH], [EF], [Ei], [EC], [XA], [XM]



Areas

- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [XL] is available in Australia.
- * [EG] is available in F.R. Germany.
- * [EB] is available in Belgium.
- * [EH] is available in Holland.
- * [EF] is available in France.
- * [Ei] is available in Italy.
- * [EC] is available in Czechoslovakia.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XM] is available in Central South America.

T4P is the standard mark for the "P-mount" plug-in-connector system. Products carrying this mark are inter-changeable and compatible with each other.

***The cabinet and dust cover are available in black color and silver types.**
***The black type model is provided with (K) in the Service Manual.**

English

Specifications

Specifications subject to change without notice.
Weight and dimensions shown are approximate.

■ General

Power supply:	~220V, 50/60 Hz (for Continental Europe)
Power consumption:	13 W
Dimensions: **(W x H x D)**	31.5 x 37.2 x 18.5 cm (12-1/2" x 14-41/64" x 7-9/32")
Weight:	6.2 kg (13.7 lb.)

■ Turntable section

Type:	Automatic turntable Auto start/Auto lead-in Auto return Auto stop Repeat play Auto speed select Manual speed selection possible Auto size select Record presence detection
Drive method:	Direct drive
Motor:	Brushless DC motor
Turntable platter:	Aluminum die-cast Diameter 30 cm (12")
Turntable speeds:	33-1/3 r.p.m and 45 r.p.m.
Wow and filter:	0.012% WRMS* 0.025% WRMS (JIS C5521) ± 0.035% peak (IEC 98A Weighted)

* Measured by obtaining signal from built-in frequency generator of motor assembly.

Rumble:	–56 dB (IEC 98A Unweighted) –78 dB (IEC 98A Weighted)

■ Tonearm section

Type:	Dynamic balanced type Linear tracking tonearm 4-pivot gimbal suspension
Effective length:	10.5 cm (4-1/8")
Tracking error angle:	Within ± 0.1°
Effective mass:	9 g (including cartridge)
Resonance frequency:	12 Hz
Tonearm drive motor:	DC motor
Phono cable ccapacitance:	150 pF

■ Cartridge section

Type:	Moving magnet stereo cartridge
Magnet circuit:	All laminated core
Frequency response:	10 Hz ~ 30 kHz 20 Hz ~ 10 kHz ± 1 dB
Output voltage:	2.5 mV at 1 kHz, 5 cm/s zero to peak lateral velocity (7 mV at 1 kHz, 10 cm/s zero to peak 45° velocity [DIN 45 500])
Channel separation:	22 dB at 1 kHz
Channel balance:	Within 2 dB at 1 kHz
Recommended load impedance:	47 kΩ ~ 100 kΩ
Compliance (dynamic):	12 x 10^{-6} cm/dyne at 100 Hz
Stylus pressure range:	1.25 ± 0.25 g (12.5 ± 2.5 mN)
Weight:	6 g (cartridge only)
Replacement stylus:	EPS-24CS

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

- The power supply for this unit varies depending upon the areas. Also, the parts used for power supply are different. So, refer to the circuit diagram and the replacement parts list.
  - * 220V (50/60 Hz) for Continental Europe.
  - * 240V (50/60 Hz) for United Kingdom and Australia.
  - * 110V/120V/220V/240V (50/60 Hz) for other areas.
  - – [XA and XM areas] for other areas is provided with voltage selector.

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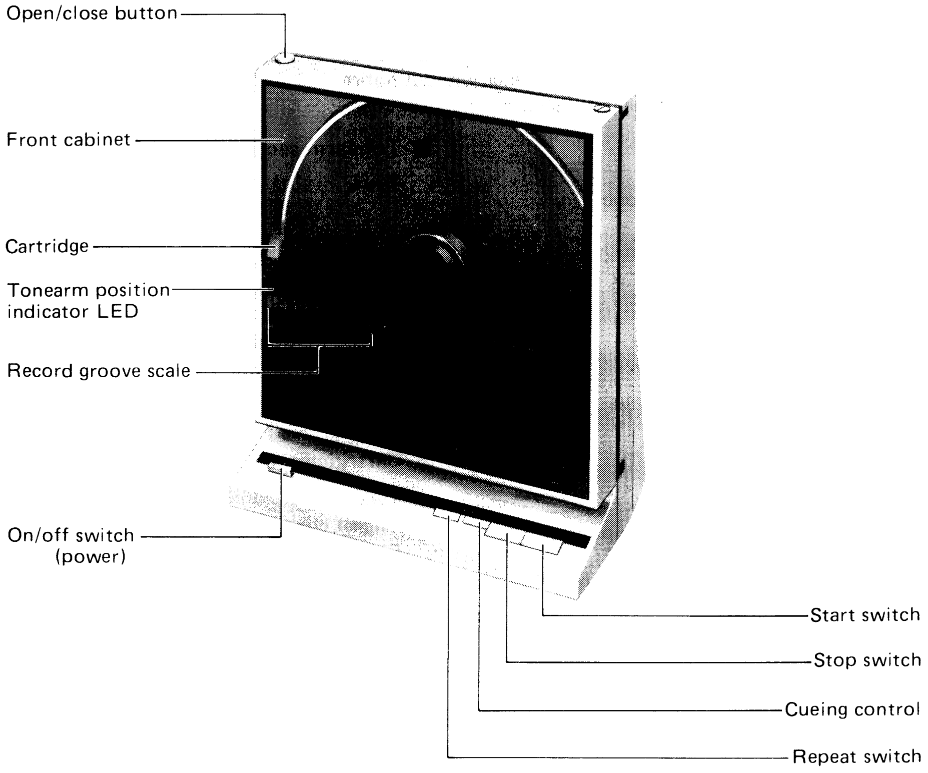
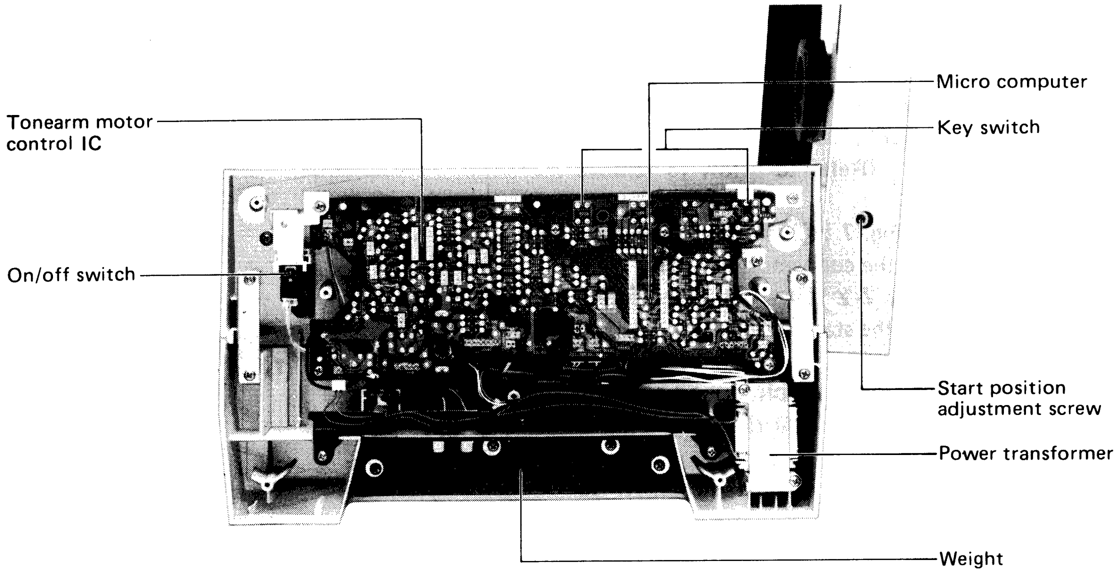
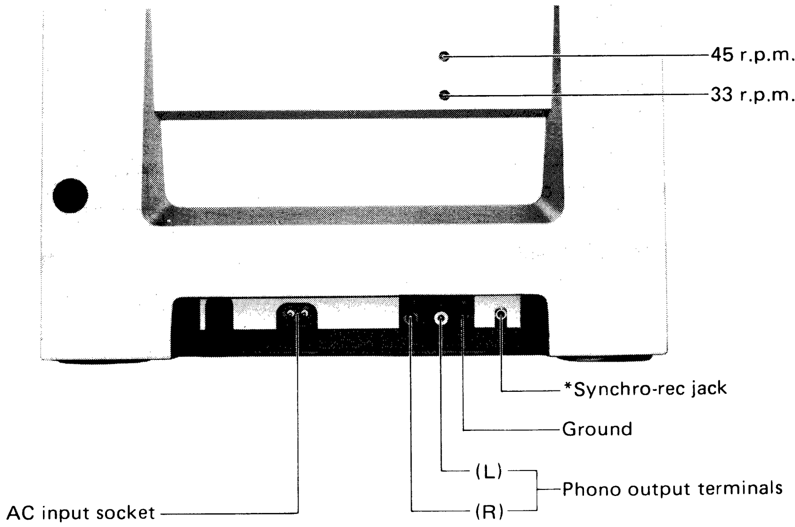
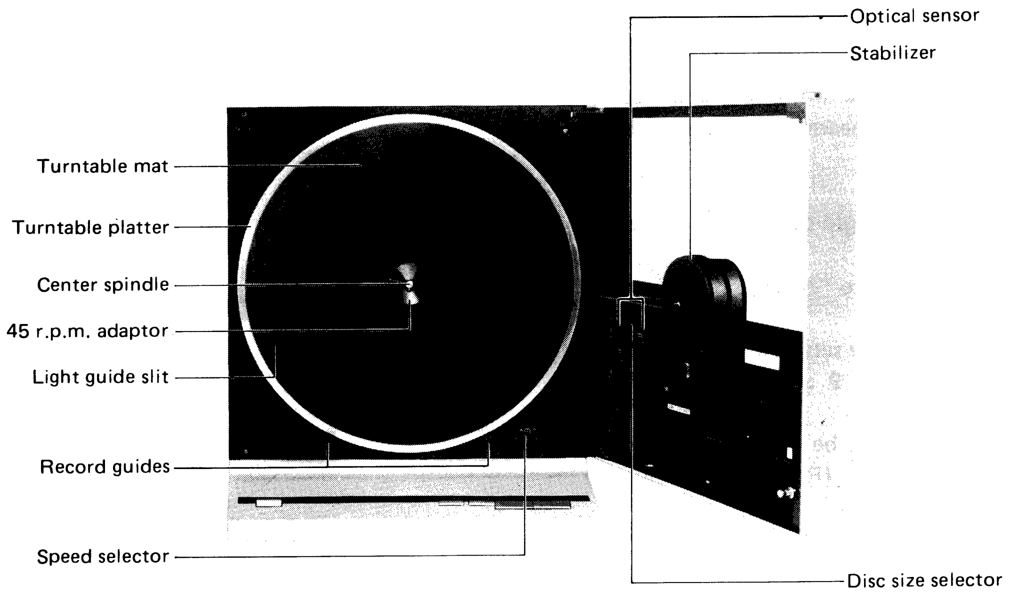
■ LOCATION OF CONTROLS

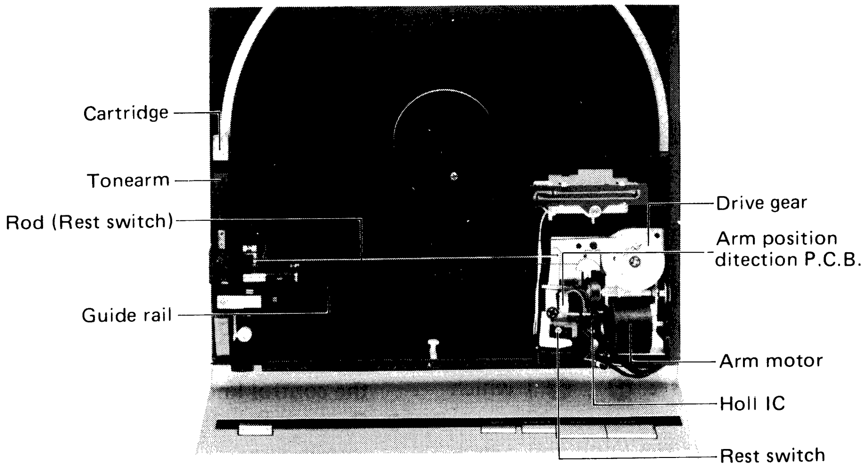

Open/close button
Front cabinet
Cartridge
Tonearm position indicator LED
Record groove scale
On/off switch (power)
Start switch
Stop switch
Cueing control
Repeat switch


Tonearm motor control IC
On/off switch
Micro computer
Key switch
Start position adjustment screw
Power transformer
Weight


45 r.p.m. adjuster
33 r.p.m. adjuster
*Synchro-rec jack
Ground
(L)
(R)
Phono output terminals
AC input socket

*Synchro-rec Jack (Synchro-rec Jack is not available)


Optical sensor
Stabilizer
Turntable mat
Turntable platter
Center spindle
45 r.p.m. adaptor
Light guide slit
Record guides
Speed selector
Disc size selector


Cartridge
Tonearm
Rod (Rest switch)
Guide rail
Drive gear
Arm position ditection P.C.B.
Arm motor
Holl IC
Rest switch

■ DISASSEMBLY INSTRUCTIONS

• How to remove the cartridge

1. Open the front cabinet.
2. Completely loosen the cartridge setscrew and then pull out the cartridge. **(Fig. 1)**

• How to remove the turntable platter

1. Open the front cabinet.
2. Turn the 45 r.p.m. adaptor counterclockwise to raise it from the turntable platter.
   *The turntable mat is glued to the turntable platter.
3. Remove the turntable platter. **(Fig. 2)**

Note: Take care not to break the claw by pushing it excessively.

4. Remove the retaining ring from the center spindle. **(Fig. 3)**
5. Hold up the turntable.

* To set the turntable platter

1. Put the turntable platter in place, and fit the cam and retaining ring onto the center spindle.
2. Put on the spring and fit the 45 r.p.m. adaptor.

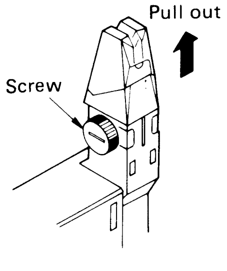
Note: Match the ⇨ on the back of 45 r.p.m. adaptor with the ⇦ of the turntable platter. **(Fig. 4)**

• How to remove the control knob cover

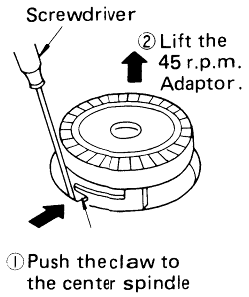
1. Remove the body cover screw caps **(Fig. 5 : ❶ ~ ❸)**.
2. Remove the 7 setscrews **(Fig. 5 : ❹ ~ ❿)** of the body cover.
3. Remove the body cover in the direction of the arrow.

Note: Slightly turn the cover as shown by the arrow because the cover is engaged with the hinge.

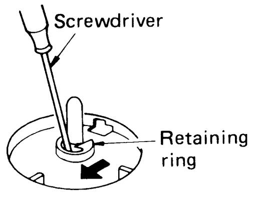
4. Remove the cover setscrew **(Fig. 5 : ⓫)**.
5. Lay down the unit with the front side up as in **Fig. 6**.
6. Remove the 6 setscrews **(Fig. 6 : ⓬ ~ ⓱)** of the bottom cover.
7. Remove the bottom cover in the direction of the arrow. **(Fig. 6)**
8. Remove the 4 setscrews **(Fig. 6 : ⓲ ~ ㉑)** which fasten the control knob cover to the cabinet. Then remove the 2 fitting plates.
9. Remove the control knob cover in the direction of arrow. **(Fig. 6-1)**


Pull out
Screw

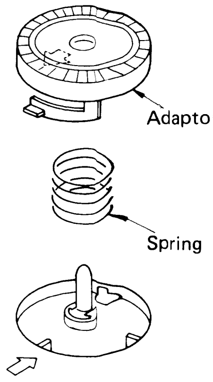
[Fig. 1]


Screwdriver
② Lift the 45 r.p.m. Adaptor.
① Push the claw to the center spindle

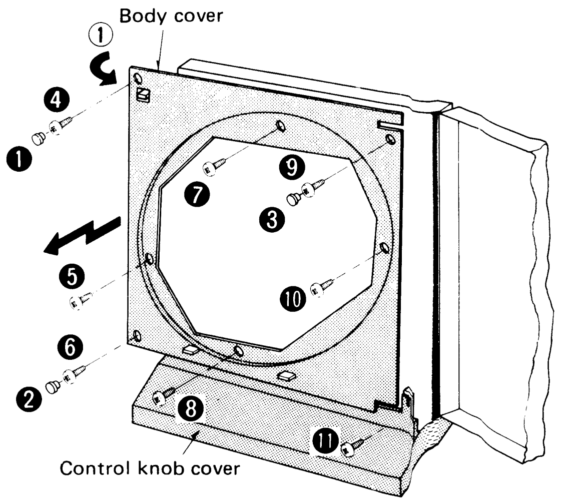
[Fig. 2]


Screwdriver
Retaining ring

[Fig. 3]


Adaptor
Spring

[Fig. 4]


Body cover
①
❹
❶
❼
❾
❸
❺
❿
❻
❷
❽
⓫
Control knob cover

[Fig. 5]

• How to remove the main circuit board

(Microcomputer, arm control and constant voltage circuit)

1. Remove the control knob cover. **(Refer to "How to remove the control knob cover".)**
2. Remove the 6 setscrews **(Fig. 6 : ㉒ ~ ㉗)** of P.C.B.

Note: Remove the P.C.B. cover. **(Fig. 6-2)**

• How to remove the on/off switch and on/off switch knob

1. Lay down the unit with the front side up.
2. Remove the bottom cover. **(Refer to "How to remove the control knob cover" item 6.)**
3. Remove the 2 setscrews **(Fig. 6-3 : ㉒ , ㉘)** which secure the on/off switch cover.
4. Take out the switch and unsolder the knob and switch terminal to remove the switch.

• How to remove the control knob

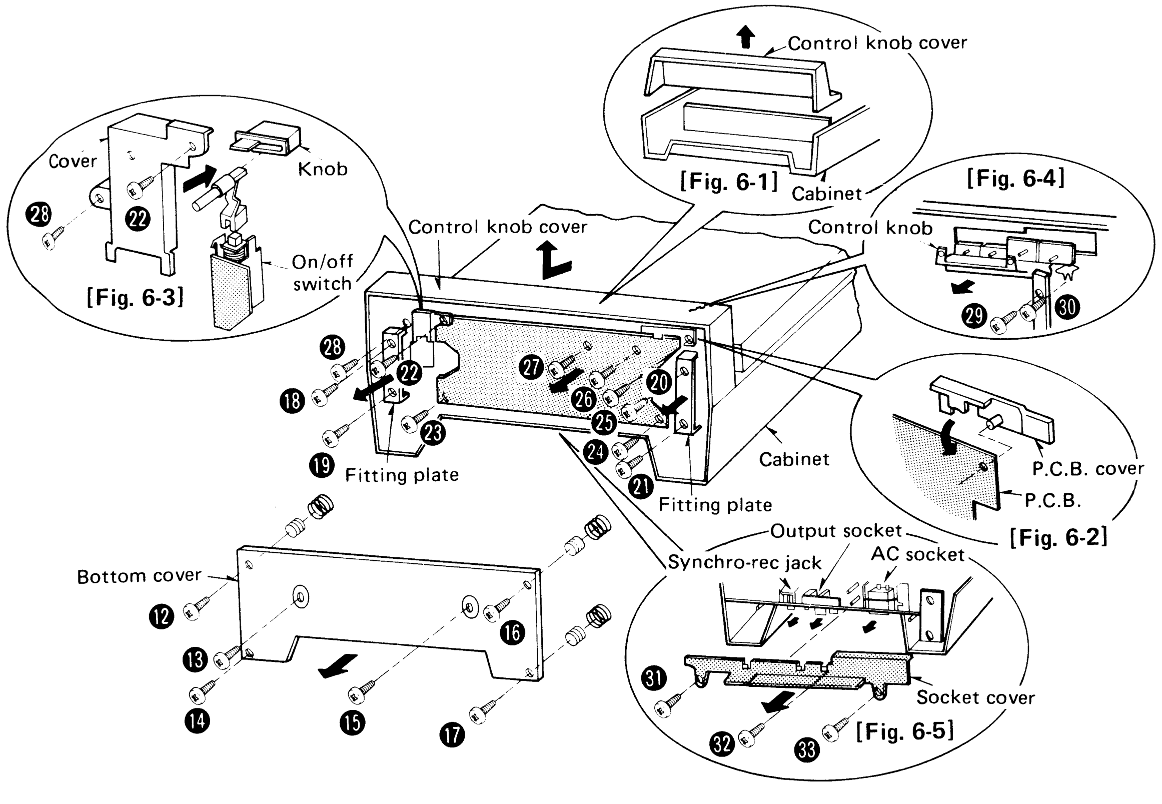
1. Remove the bottom cover. **(Refer to "How to remove the control knob cover" item 6.)**
2. Remove the main circuit board. **(Refer to "How to remove the main circuit board".)**
3. Remove the 2 setscrews **(Fig. 6-4 : ㉙ , ㉚)** of the control knob.
4. Remove the knob in the direction of the arrow.

• How to remove the output socket, AC socket, and synchro-rec jack

1. Remove the bottom cover. **(Refer to "How to remove the control knob cover item 6.")**
2. Remove the 3 setscrews **(Fig. 6-5 : ㉛ ~ ㉝)** of the socket cover.
3. Remove the cover in the direction of the arrow.

Note: Pull out the 2-pin connector (CN1) and then remove the cover.

4. Remove each socket in the direction of the arrow.


Cover
Knob
㉘
㉒
On/off switch
[Fig. 6-3]
Control knob cover
[Fig. 6-1]
Cabinet
[Fig. 6-4]
Control knob
㉙
㉚
Control knob cover
㉘
㉒
⑱
㉓
⑲
Fitting plate
㉗
㉖
⑳
㉕
㉔
㉑
Fitting plate
Cabinet
P.C.B. cover
P.C.B.
[Fig. 6-2]
Output socket
AC socket
Synchro-rec jack
㉛
㉜
㉝
Socket cover
[Fig. 6-5]
Bottom cover
⑫
⑬
⑭
⑮
⑯
⑰

[Fig. 6]

• How to remove the drive circuit board and stator frame

1. Open the front of the unit.
2. Remove the turntable platter. **(Refer to "How to remove the turntable platter".)**
3. Remove the body cover. **(Refer to "How to remove the control knob cover".)**
4. Remove the 6 setscrews **(Fig. 7 : ㉞ ~ ㊳)** of the drive circuit board, and pull out the connector (CN201).
5. Remove the setscrews **(Fig. 7-1 : ㊵ ~ ㊸)** to separate the drive circuit board and the stator frame.

• How to remove the cabinet switch, speed selector switch knob and connection board

1. Open the front of the unit.
2. Remove the turntable platter. **(Refer to "How to remove the turntable platter".)**
3. Remove the body cover. **(Refer to "How to remove the control knob cover".)**
4. Remove the cabinet switch setscrew **(Fig. 7 : ㊹).**
5. Release the switch cover claw from the board and then remove the switch cover. **(Fig. 7-2)**
   Unsolder the switch terminal to remove the switch.
6. Remove the 2 setscrews **(Fig. 7 : ㊺ , ㊻)** of the speed selector switch knob, and remove the control knob cover. **(Refer to "How to remove the control knob cover".)**
   The knob can be removed in the direction of the arrow. **(Fig. 7-3)**
7. Remove the 2 setscrews **(Fig. 7 : ㊼ , ㊽),** and then the connector board can be removed.

• How to remove the dust cover

1. Remove the 4 setscrews **(Fig. 8 : ㊾ ~ (52))** of the dust cover.
2. Remove the dust cover in the direction of the arrow.

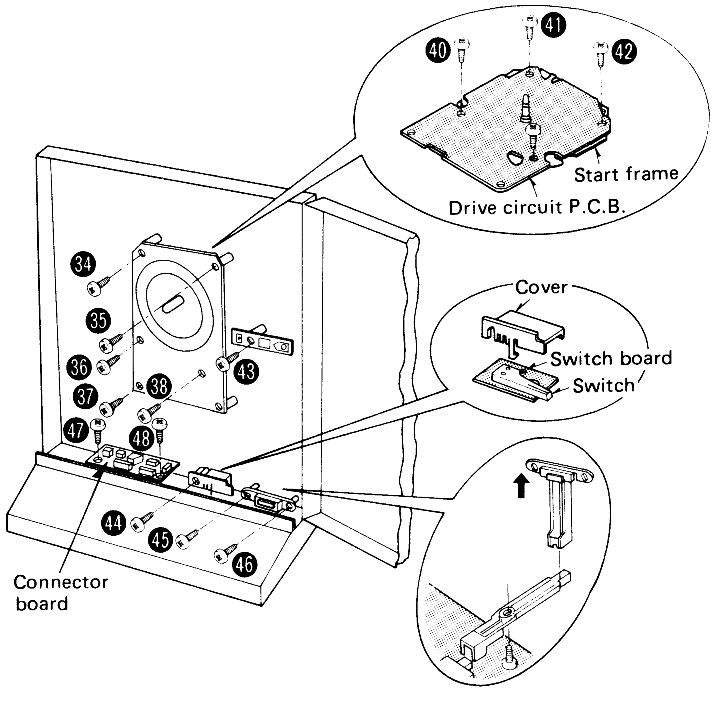
• How to remove the tonearm

1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Turn the worm gear by hand and slightly shift the tonearm inward.
3. Remove the tonearm setscrew **(Fig. 9 : (53)).**
4. Disconnect the output lead wire from the connector board and then remove the tonearm in the direction of the arrow. **(Fig. 9)**

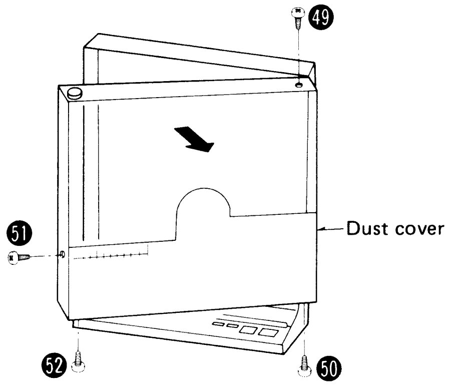
• How to remove the offset angle detection circuit board

1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Remove the stylus indicator cover setscrew **(Fig. 9 : (54)).**
3. Loosen the P.C.B. setscrew **(Fig. 9 : (55))** and lift the P.C.B.

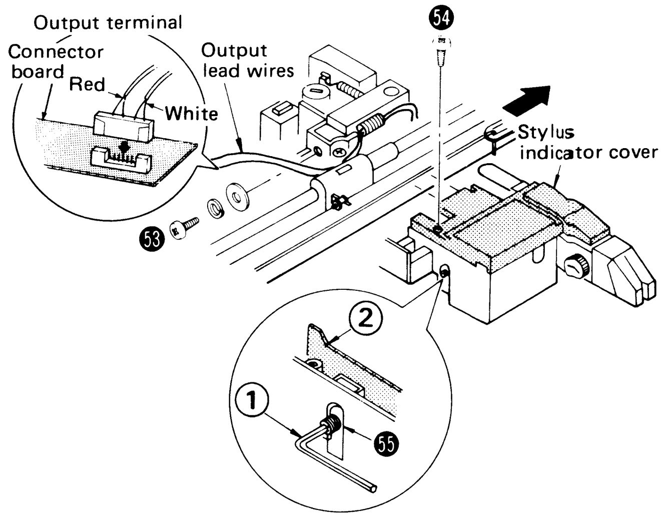
Note: When the P.C.B. is removed, be sure to adjust the servo gain and offset voltage. (Refer to the adjusting procedure on P13.)


㊵
㊶
㊷
Start frame
Drive circuit P.C.B.
㉞
㉟
㊱
㊲
㊳
㊸
㊼
㊽
Cover
Switch board
Switch
㊹
㊺
㊻
Connector board

[Fig. 7]


㊾
(51)
Dust cover
(52)
㊿

[Fig. 8]


Output terminal
Connector board
Red
White
Output lead wires
(54)
Stylus indicator cover
(53)
②
①
(55)

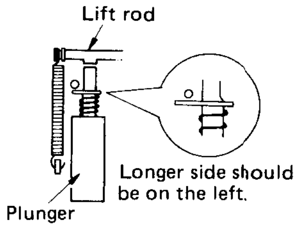
① Turn the hex. rod wrench (M3) to counterclockwise.
② Lift the P.C.B.

[Fig. 9]

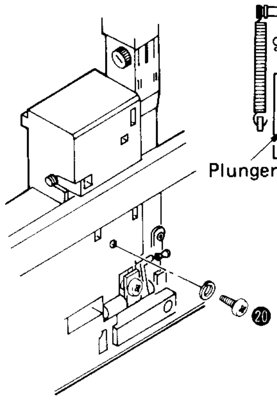
• How to remove the cueing plunger

1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Remove the plunger setscrew (**Fig. 10 : (56)**).
3. Remove the offset angle detection P.C.B. and unsolder the 2 leads of plunger. Then the plunger can be removed.

Note: The plunger should be fitted in the position as in **Fig. 11.**


Lift rod
Plunger
Longer side should be on the left.

[Fig. 11]

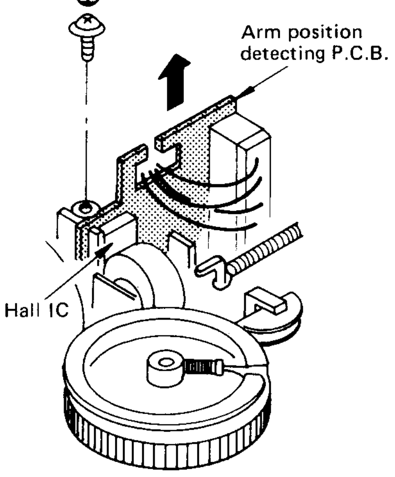


[Fig. 10]

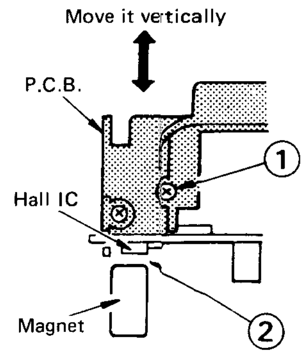
• How to remove the Arm position detecting P.C.B.

1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Remove the P.C.B. setscrew (**Fig. 12 : (57)**).

Note: The clearance between Hall IC and magnet should be 0.8 mm ± 0.2 mm. It can be adjusted as in **Fig. 13.**


㉒
Arm position detecting P.C.B.
Hall IC

[Fig. 12]

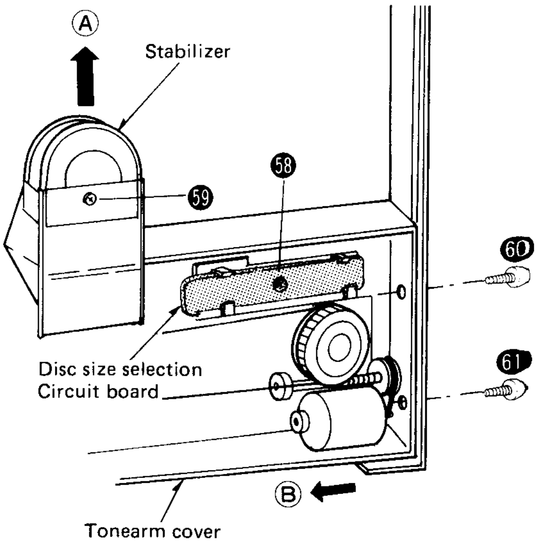

Move it vertically
P.C.B.
①
Hall IC
Magnet
②

Adjusting method
① Loosen the screw.
② Move the P.C.B. so that the clearance between Hall IC and magnet is 0.8 ± 0.2 mm, and then tighten the setscrew.

[Fig. 13]

• How to remove the disc size selector (record size selection P.C.B.), stabilizer, and tonearm cover

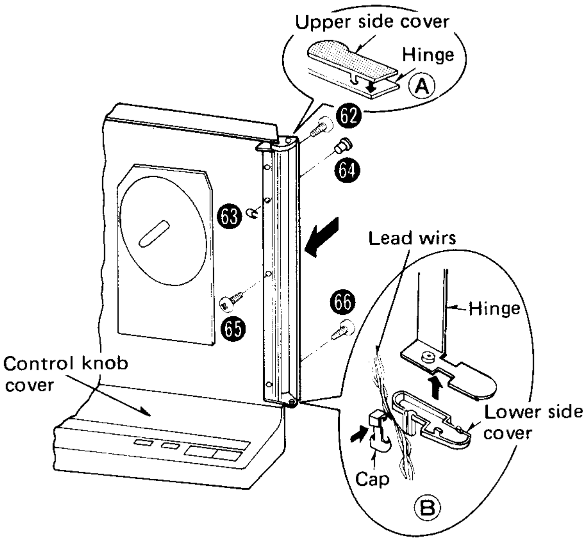
1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Remove the disc size selector setscrew (**Fig. 14 : (58)**).
3. Remove the stabilizer setscrew (**Fig. 14 : (59)**).
4. Remove the stabilizer in the direction of the arrow Ⓐ.
5. Remove the tonearm cover setscrews (**Fig. 14 : (60) , (61)**).
6. Remove the tonearm in the direction of the arrow Ⓑ.


Ⓐ
Stabilizer
(58)
(59)
(60)
(61)
Disc size selection Circuit board
Ⓑ
Tonearm cover

[Fig. 14]

• How to remove the hinge

1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Remove the body cover. **(Refer to "How to remove the control knob cover".)**
3. Remove the control knob cover. **(Refer to "How to remove the control knob cover".)**
4. Remove the hinge setscrews and stopper rings **(Fig. 15 : (62) ~ (66)).**
5. Remove the hinge in the direction of the arrow, and then remove the upper and lower side covers of hinge.


Upper side cover
Hinge
Ⓐ
(62)
(64)
(63)
Lead wirs
(66)
Hinge
(65)
Control knob cover
Lower side cover
Cap
Ⓑ

[Fig. 15]

* To fit the hinge . . . . .

1. Fit the upper side cover to the hinge. **(Fig. 15 : Ⓐ)**
2. Fit the lower side cover to the hinge. **(Fig. 15 : Ⓑ)**

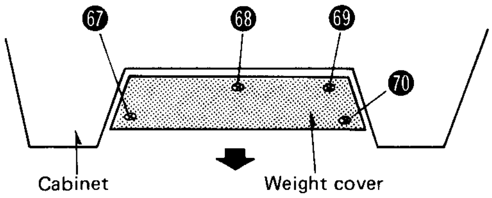
Note: Fit the leads in the lower side cover groove, and set with leads clamper.

3. Secure the hinge with setscrews **(Fig. 15 : (62) ~ (66)).**

• How to remove the weight

Note: Remember to set the weight when the cabinet is replaced.

1. Lay down the unit with the front side up.
2. Remove the 4 setscrews **(Fig. 16 : (67) ~ (70))** of the weight cover.
3. Remove the cover in the direction of the arrow and take out the weight.

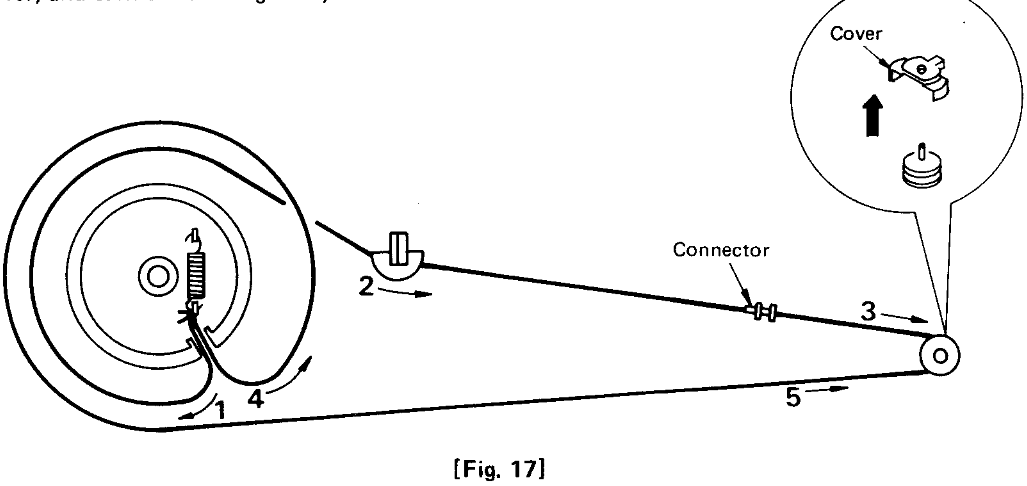

(67)
(68)
(69)
(70)
Cabinet
Weight cover

[Fig. 16]

■ HOW TO SET THE TONEARM DRIVE ROPE

Set the rope according to the following procedure.

1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Remove the roller cover. **(Fig. 17)**
3. Set the rope in the order of 1 ~ 5. **(Fig. 17)**
4. Attach the rope connector to the tonearm.
5. Set the roller cover, and turn the worm gear by hand to see that the tonearm moves.

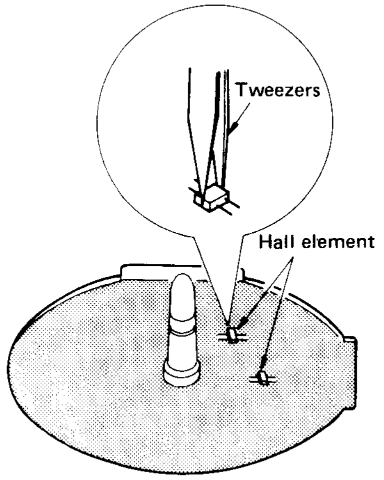

Cover
Connector
1
2
3
4
5

[Fig. 17]

- **How to remove Hall element**

1. Remove the turntable platter.
2. Remove the terminal solder by use of solder sucker.
3. Hold the Hall element with a tweezers and remove it while touching the soldering iron to the terminal.

Note: Fit the Hall element with the part No. printed up. The revers in terminal position is allowable provided that the printed side is up.



[Fig. 18]

■ HOW TO REPLACE CHIPS (RESISTORS)

- **Replacing procedure**

1. Put solder on the foil where the chip is fitted, and then solder the chip by touching the soldering iron to it as shown in **Fig. 19.**

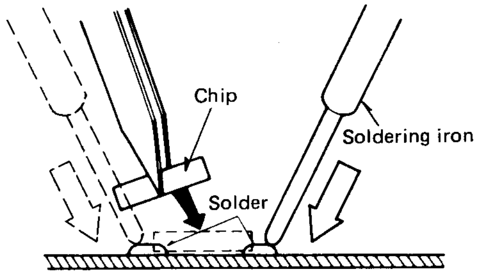
- **Removing procedure**

1. Completely unsolder the both ends of the chip bu use of solder sucker.
2. Remove chip with tweezers by rotating it while removing solder as shown in **Fig. 20.**

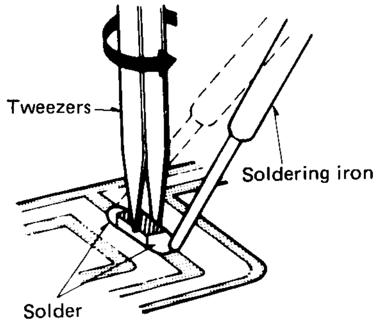
Note: Do not use chip again which is removed from P.C.B.

[Note for replacing chips]

1. Do not heat the chip more than 3 seconds.
2. Do not rub the electrode against the chip.
3. Use the tweezers with care not to damage the surface of the chip.
4. It is desirable to use a pencil type soldering iron.
   And use soldering ilon less than 60 W.

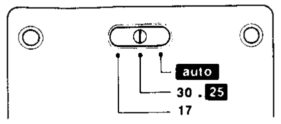
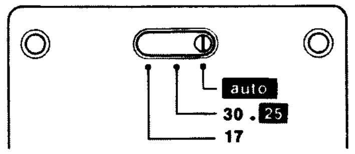


[Fig. 19]



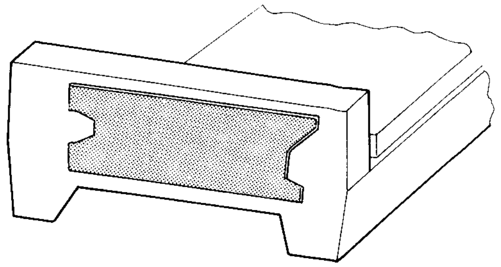
[Fig. 20]

■ The turntable may not perform as expected when playing the following kinds of records. This does not mean that there is anything wrong with the turntable. In such cases, follow the directions below.

Record		Operation	Notes
■ 25 cm records. 		1. Set the disc size selector at the "30. 25" position. 2. **Hold down the start switch so that the tonearm moves over to a position above the desired record's lead-in grooves.** 3. Push the cueing control.	**• Ordinarily, the disc size selector should be left at the "auto" position.**  **• Repeat play is not possible for 25 cm records or records that do not meet the industry standard dimensions because size is not automatically detected.** **• Set the speed selector to 33 or 45 depending on the correct speed for the record in question.** **• In some cases it is not possible to play records that do not meet the industry standard dimensions.**
■ Records that are transparent, colored or translucent black-any record that does not completely block light.	30 cm record	1. Set the disc size detector at the "30. 25" position. 2. Use with the auto play or search play mode.	
	17 cm record	1. Set the disc size detector at the "17" position. 2. Use with the auto play or search play mode.	

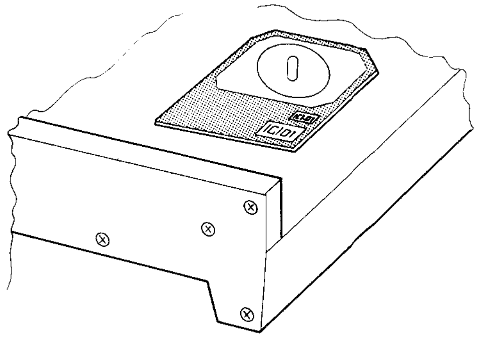
■ CHECKING METHOD (Refer to "Disassembly Instructions")

1. **Main P.C.B. checking method (Fig. A)**
   1) Lay down the unit.
   2) Remove the bottom plate.
   3) Put on the record and check each circuit from the bottom of the unit.



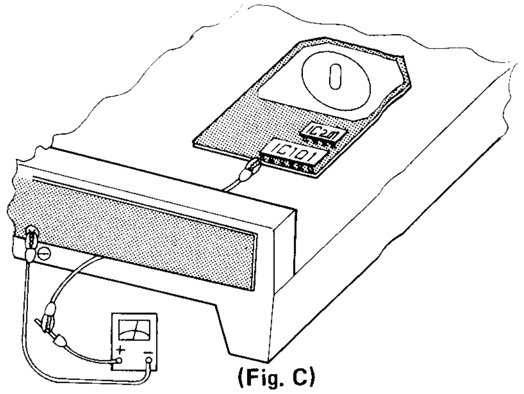
(Fig. A)

2. **Turntable drive circuit checking method (in stop mode) (Fig. B).**
   1) Lay down the unit.
   2) Open the front cabinet.
   3) Remove the turntable platter.
   4) Turn on the on/off switch and check the drive circuit.



(Fig. B)

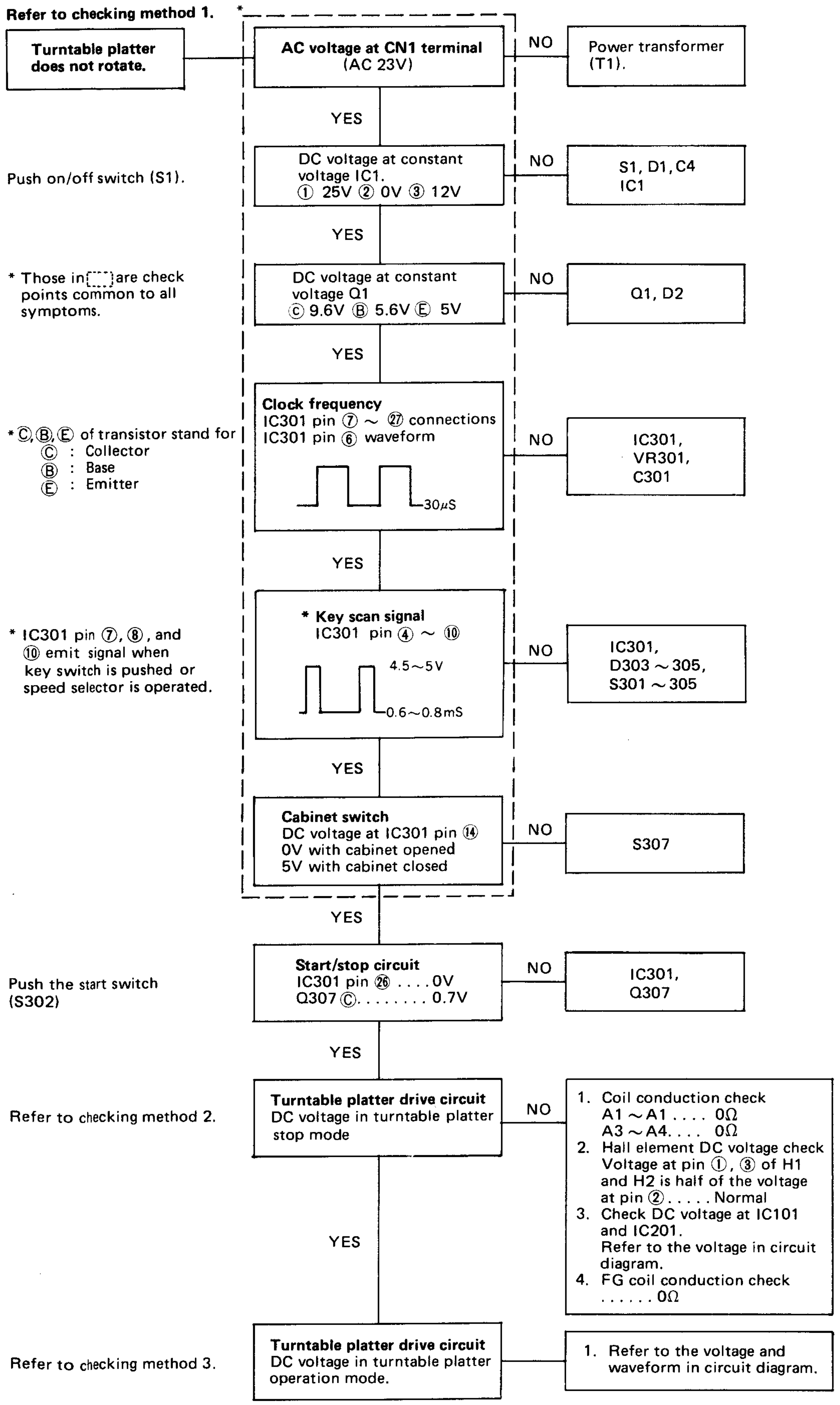
3. **Turntable drive circuit checking method (in operation mode) (Fig. C)**
   1) Lay down the unit.
   2) Remove the bottom plate.
   3) Open the front cabinet and remove the turntable platter.
   4) Insert the lead into the gap at the bottom and connect it to the probe. (When use oscilloscope and tester)
   5) Set the turntable platter and turn on the power switch to start the turntable.
   6) Check the circuit in turntable operation mode.

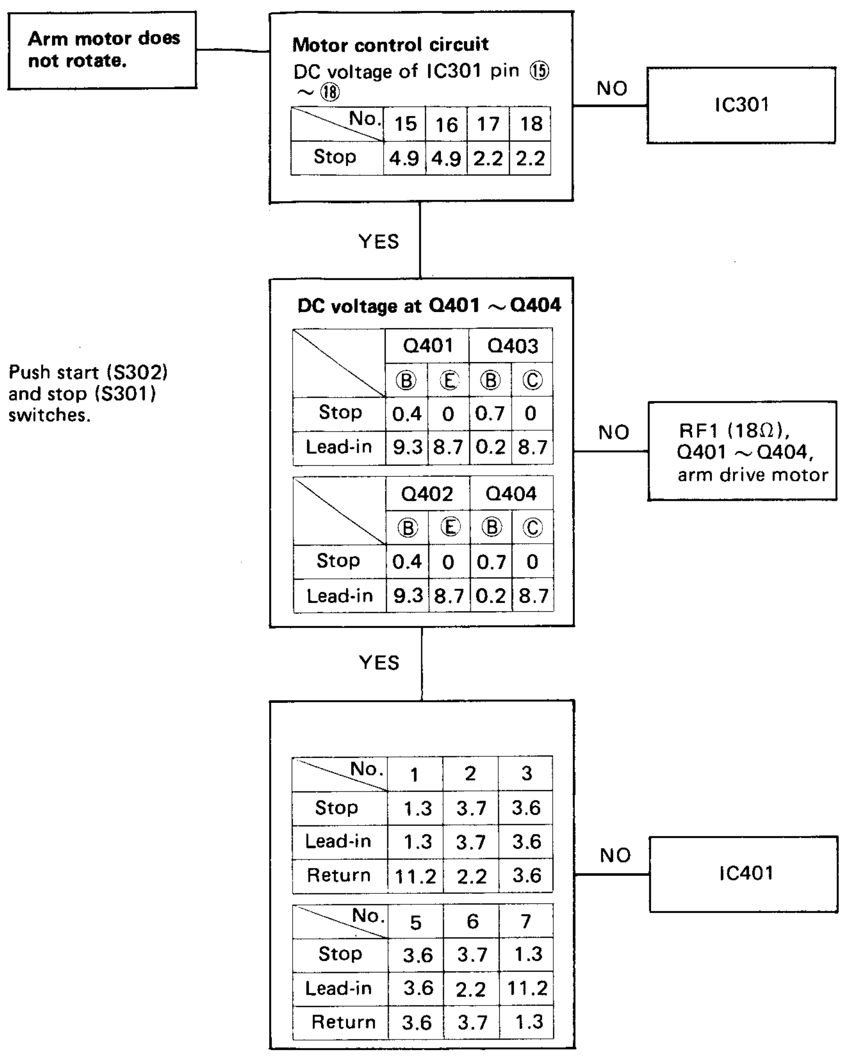


(Fig. C)

4. **Offset angle detecting sensor and Arm position detecting Hall IC checking method**
   1) Remove the dust cover.
   2) Check each circuit.

■ TROUBLE SHOOTING


Refer to checking method 1.
Turntable platter does not rotate.
AC voltage at CN1 terminal (AC 23V)
NO
Power transformer (T1).
YES
Push on/off switch (S1).
DC voltage at constant voltage IC1. ① 25V ② 0V ③ 12V
NO
S1, D1, C4 IC1
YES
* Those in [ ] are check points common to all symptoms.
DC voltage at constant voltage Q1 ⓒ 9.6V Ⓑ 5.6V Ⓔ 5V
NO
Q1, D2
YES
* Ⓒ, Ⓑ, Ⓔ of transistor stand for
Ⓒ : Collector
Ⓑ : Base
Ⓔ : Emitter
Clock frequency
IC301 pin ⑦ ~ ㉗ connections
IC301 pin ⑥ waveform
30μS
NO
IC301, VR301, C301
YES
* IC301 pin ⑦, ⑧, and ⑩ emit signal when key switch is pushed or speed selector is operated.
* Key scan signal
IC301 pin ④ ~ ⑩
4.5~5V
0.6~0.8mS
NO
IC301, D303 ~ 305, S301 ~ 305
YES
Cabinet switch
DC voltage at IC301 pin ⑭
0V with cabinet opened
5V with cabinet closed
NO
S307
YES
Push the start switch (S302)
Start/stop circuit
IC301 pin ㉖ 0V
Q307 Ⓒ. 0.7V
NO
IC301, Q307
YES
Refer to checking method 2.
Turntable platter drive circuit
DC voltage in turntable platter stop mode
NO
1. Coil conduction check
A1 ~ A1 . . . . 0Ω
A3 ~ A4. . . . 0Ω
2. Hall element DC voltage check
Voltage at pin ①, ③ of H1 and H2 is half of the voltage at pin ② . . . . . Normal
3. Check DC voltage at IC101 and IC201.
Refer to the voltage in circuit diagram.
4. FG coil conduction check
. . . . . . 0Ω
YES
Refer to checking method 3.
Turntable platter drive circuit
DC voltage in turntable platter operation mode.
1. Refer to the voltage and waveform in circuit diagram.


Arm motor does not rotate.
Motor control circuit
DC voltage of IC301 pin ⑮ ~ ⑱
NO
IC301
YES
DC voltage at Q401 ~ Q404
Push start (S302) and stop (S301) switches.
NO
RF1 (18Ω), Q401 ~ Q404, arm drive motor
YES
NO
IC401

Motor control circuit
DC voltage of IC301 pin ⑮ ~ ⑱

No.	15	16	17	18
Stop	4.9	4.9	2.2	2.2

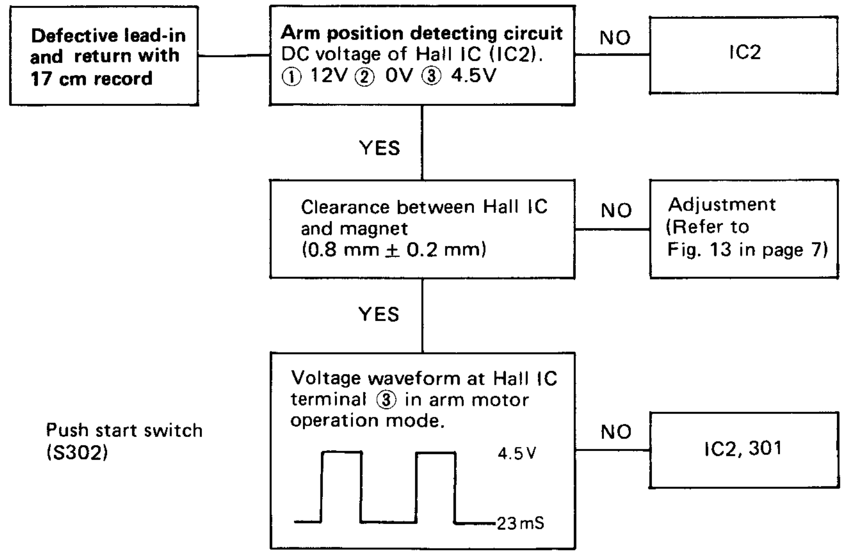
DC voltage at Q401 ~ Q404

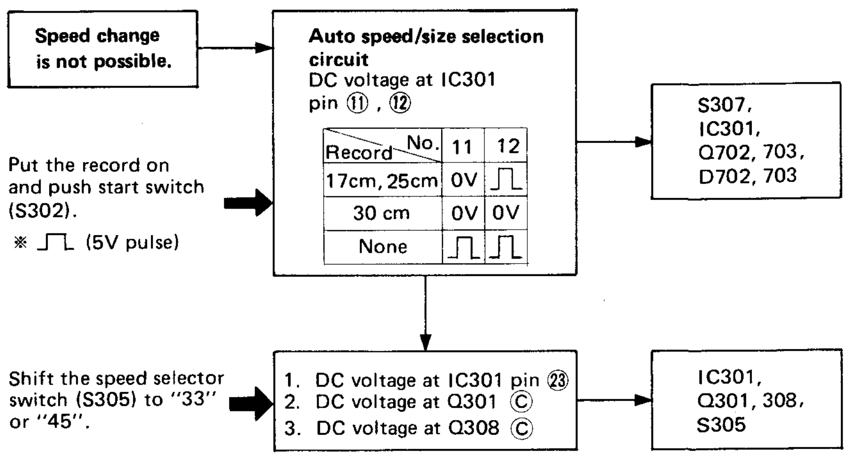
	Q401		Q403	
	Ⓑ	Ⓔ	Ⓑ	Ⓒ
Stop	0.4	0	0.7	0
Lead-in	9.3	8.7	0.2	8.7

	Q402		Q404	
	Ⓑ	Ⓔ	Ⓑ	Ⓒ
Stop	0.4	0	0.7	0
Lead-in	9.3	8.7	0.2	8.7

No.	1	2	3
Stop	1.3	3.7	3.6
Lead-in	1.3	3.7	3.6
Return	11.2	2.2	3.6

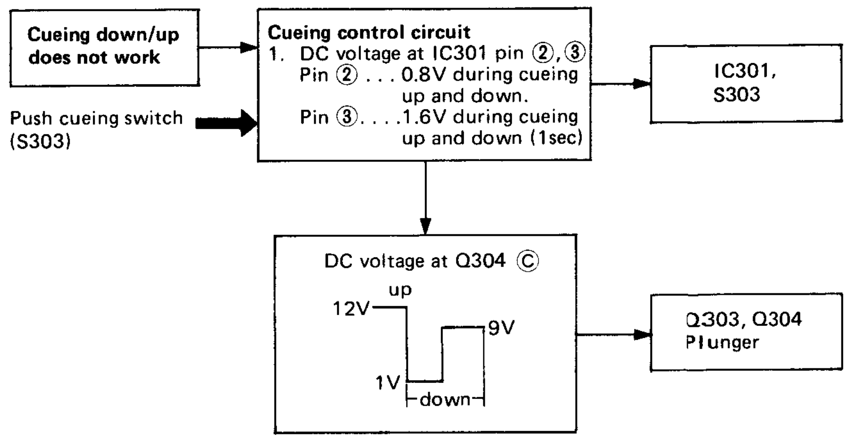
No.	5	6	7
Stop	3.6	3.7	1.3
Lead-in	3.6	2.2	11.2
Return	3.6	3.7	1.3

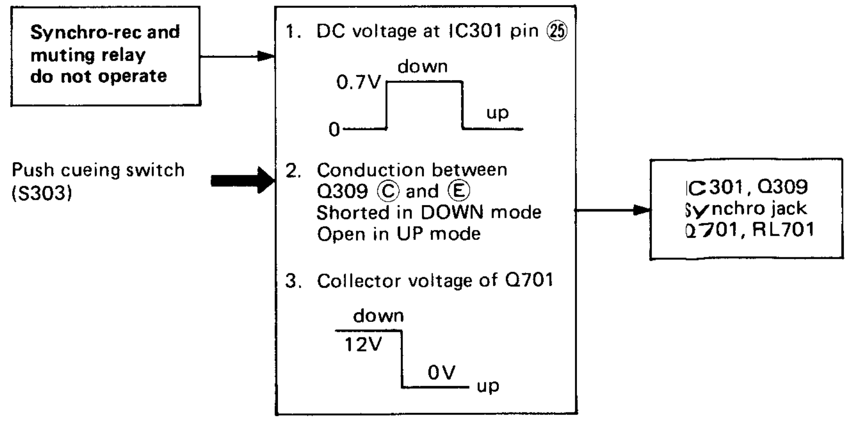

Defective lead-in and return with 17 cm record
Arm position detecting circuit
DC voltage of Hall IC (IC2).
① 12V ② 0V ③ 4.5V
NO
IC2
YES
Clearance between Hall IC and magnet (0.8 mm ± 0.2 mm)
NO
Adjustment (Refer to Fig. 13 in page 7)
YES
Push start switch (S302)
Voltage waveform at Hall IC terminal ③ in arm motor operation mode.
4.5V
23mS
NO
IC2, 301


Speed change is not possible.
Put the record on and push start switch (S302).
※ ⎍ (5V pulse)
Auto speed/size selection circuit
DC voltage at IC301 pin ⑪, ⑫
S307, IC301, Q702, 703, D702, 703
Shift the speed selector switch (S305) to "33" or "45".
1. DC voltage at IC301 pin ㉓
2. DC voltage at Q301 Ⓒ
3. DC voltage at Q308 Ⓒ
IC301, Q301, 308, S305

Auto speed/size selection circuit
DC voltage at IC301 pin ⑪, ⑫

Record \ No.	11	12
17cm, 25cm	0V	⎍
30 cm	0V	0V
None	⎍	⎍


Cueing down/up does not work
Push cueing switch (S303)
Cueing control circuit
1. DC voltage at IC301 pin ②, ③
Pin ② . . . 0.8V during cueing up and down.
Pin ③. . . .1.6V during cueing up and down (1sec)
IC301, S303
DC voltage at Q304 Ⓒ
up
12V
9V
1V
down
Q303, Q304 Plunger


Synchro-rec and muting relay do not operate
Push cueing switch (S303)
1. DC voltage at IC301 pin ㉕
0.7V
down
0
up
2. Conduction between Q309 Ⓒ and Ⓔ
Shorted in DOWN mode
Open in UP mode
3. Collector voltage of Q701
down
12V
0V
up
IC301, Q309 Synchro jack Q701, RL701

MEASUREMENTS AND ADJUSTMENT

• Equipment used and condition of the set

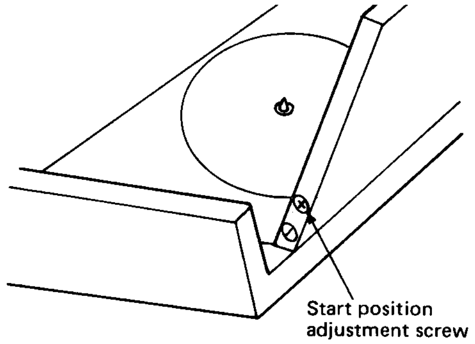
1. Oscilloscope
2. DC voltmeter
3. 30 cm record
4. Screwdrivers ⊕ , ⊖
5. Hex. rod wrench (M3)

Step	Item	Preparations	Portion	Procedure
1	Start position	1. Put 30 cm record on and close the front cabinet. 2. Turn on the on/off switch. 3. Push the start switch.	Start position screw **(Fig. 21)**	1. Open the front cabinet. 2. If the tonearm drops between tunes, adjust it by turning the screw counterclockwise. 3. If the tonearm drops to outside the record, adjust it by turning the screw clock wise.
2	Tonearm offset angle	1. Open the front cabinet, and hold the cabinet switch with tape. 2. Blind the 2 inside light guide slits with 2 black tapes. 3. Turn on the on/off switch. Push the start switch to shift the tonearm inward.	Offset angle adjustment screw **(Fig. 23)**	1. Turn the offset angle adjustment screw so that the tonearm center matches the V-groove of lift rod.
3	Servo gain	1. Connect the voltmeter to CN303 terminal 3 (+) and 2 (–) of main P.C.B. **(Fig. 22)** 2. Turn on the on/off switch.	VR501 **(Fig. 24)**	1. Completely shift the tonearm to the right. 2. Adjust the VR501 so that the output voltage is 3.6V.
4	Offset voltage	1. Connect DC voltmeter to CN303 terminal ③ (+) and ② (–) of main P.C.B. **(Fig. 22)** 2. Turn on the on/off switch.	Offset voltage adjustment screw **(Fig. 24)**	1. Shift the tonearm to the center. 2. Turn the adjustment screw so that the output voltage is 1.8V. (Use hex. rod wrench.)
5	Clock frequency	1. Connect Q1 emitter and IC301 pin ⑦ with a jumper. **(Fig. 22)** 2. Connect the oscilloscope to IC301 pin ⑥.	VR301 **(Fig. 22)**	1. Turn on the on/off switch. 2. Adjust VR301 so that the output waveform cycle is 30μs ± 1 μs.
6	Rotating speed	1. Open the front cabinet, and put the record on.. 2. Put the stroboscope on. 3. Close the front cabinet.	VR201 (45 r.p.m.) VR202 (33 r.p.m.)	1. Turn on the on/off swifch. 2. Set the speed selector switch to 45 r.p.m. 3. Adjust VR201 so that the speed is at the rating speed (45 r.p.m.). 4. Set the speed selector switch to 33 r.p.m. 5. Adjust VR202 so that the speed is at the rating speed (33-1/3 r.p.m.) **Note:** Be sure to adjust the speed 45 r.p.m. first.

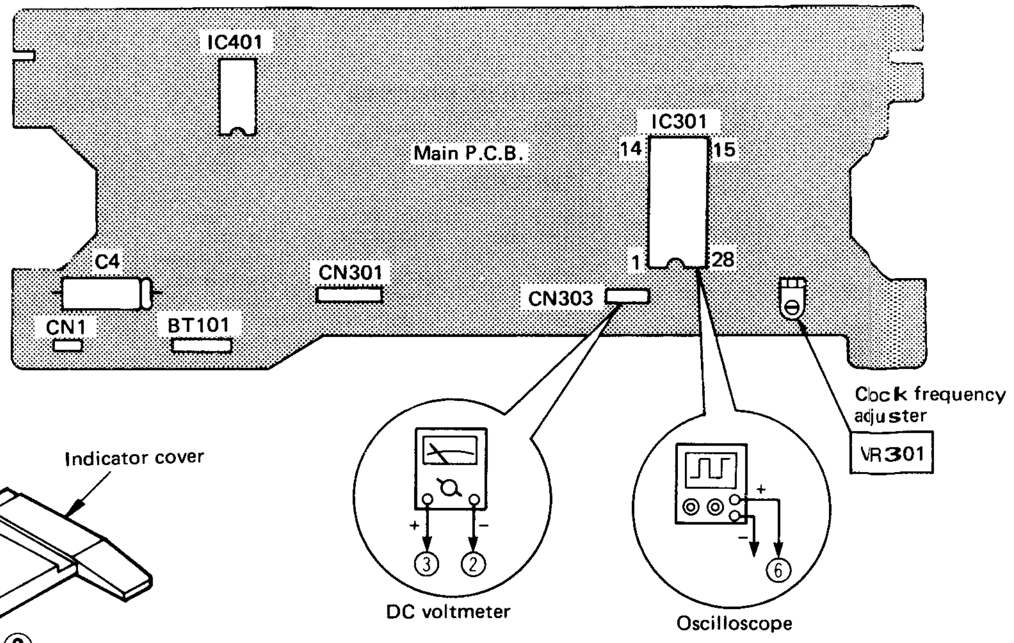
TERMINAL DESCRIPTION OF MN1421FPC

* **Mentioned here are the basic functions of the MN1421FPC.**
So, there may be terminals not needed or partial change in circuit function depending on the using method.

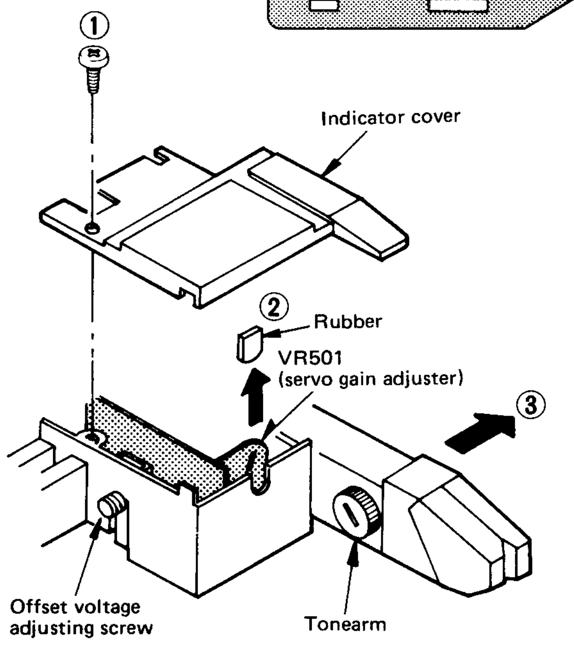
No.	Symbol	Description
1	VSS	Grand terminal
2	CO9	Cueing control terminal ("H" during cueing up and down)
3	CO8	Cueing control terminal ("H" only during cueing down for about 1 sec.)
4 5 6	CO7 CO6 CO5	Key scan output terminal
7 8 9 10	Ai3 Ai2 Ai1 Ai0	Key scan input terminal
11 12	Bi3 Bi2	Auto size and speed change terminals (Terminals ⑪ , ⑫ at "L" → 30 cm record 33 r.p.m. ⑪ at "L", ⑫ at "H" → 17 cm record 45 r.p.m.)
13	Bi1	Rest position detecting terminal ("H" when tonearm is in rest position.)
14	Bi0	Cabinet open/close detecting terminal
15 16 17 18	EO0 EO1 EO2 EO3	Tonearm drive motor control terminal (arm servo)
19	TEST	Test terminal (nut used, connected to grand)
20	RST	Reset terminal (micon is reset at "L")
21	SNS1	Offset angle detecting output/input terminal
22	SNS1	Arm position detecting input terminal
23	DO0	Turntable platter speed change terminal ("H" at 45 r.p.m.; "L" at 33 r.p.m.)
24	DO1	Repeat indicator terminal (ON at "L")
25	DO2	Synchro-rec on/off terminal ("L" at on; "L" at off)
26	DO3	Turntable platter start/stop terminal ("L" at start; "H" at stop)
27	VDD	Power supply (+5V)
28	OSC	Oscillation terminal (clock frequency is adjusted to 30μs ± 1μs)



[Fig. 21]

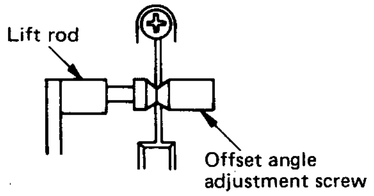


[Fig. 22]



①Remove the indicator cover.
②Remove the rubber
③Shift the tonearm in the direction on the arrow during servo gain adjustment.

[Fig. 24]



[Fig. 23]

■ REPLACEMENT PARTS LIST...Electric Parts

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
   Components indentified by ⚠ make have special characteristcs important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Areas

- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [XL] is available in Australia.
- * [EG] is available in F.R. Germany.
- * [EB] is available in Belgium.
- * [EH] is available in Holland.
- * [EF] is available in France.
- * [Ei] is available in Italy.
- * [EC] is available in Czechoslovakia.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XM] is available in Central South America.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	AN7812	Regulator
IC2	DN6838S	Arm Position Detector
IC101	AN6636	Drive
IC201	AN6552	F.G.Amplifier & Constant Voltage (Hall Element)
IC301	MN1421FPC	Micro Computer
IC401	AN6554	Operation Amplifier
TRANSISTORS		
Q1	2SD638	Regulator
Q301,303	2SD636	Speed Selector, Cueing Drive
Q304	2SD892	Cueing Drive
Q305	2SB641	Offset Angle Detector
Q306,307	2SD636	Offset Angle Detector
Q308	2SB641	Speed Selector
Q309	2SD636	Synchro-rec Selector
Q401,402	2SD973	Arm Motor Control
Q403,404	2SD638	Arm Motor Control
Q701	2SD636	Muting Drive
Q702,703	PN150MS	Disk Size Selector

Ref. No.	Part No.	Description
DIODES		
D1 ⚠	SVDS1RBA20F	Rectifier
D2 S	MA1056	5.6V Zener
D301 S	RVDRD7R5FB	7.5V Zener
D302	LN81CPH	Light Emitting Diode(Repeat)
D303~305 S	MA162A	Key Matrix
D501 S	MA162A	Diode
D503	SVDEBR3432S	Light Emitting Diode(Stylus Position)
D701 S	MA162A	Muting Relay Drive
D702,703	SVDEBR5505S	Light Emitting Diode(Record Size)
PHOTO INTERRUPTER		
PC501	ON1186	Offset Angle Detector
SWITCHES		
SI ⚠	SFDSCO5N08	On/off(Power)
S301~304	EVQQJRO2K	Start, Stop, Cueing & Repeat
S305	SFDSHSW0757	Speed Selector
S307	SFDSCO5NO1	Cabinet
S601	SFDSCO2N03	Rest
S901	SFDSHXW225−2	Voltage Selecter

Ref. No.	Part No.	Description
HALL ELEMENTS		
H1,2	OH−002	Turntable Position Detector
VARIABLE RESISTORS		
VR201 S	EVTS3MA00B54	45r.p.m. Adjuster 50kΩ(B)
VR202 S	EVTS3MA00B54	33r.p.m. Adjuster 50kΩ(B)
VR301	EVNK6AA00B54	Clock Frequency Adjuster 50kΩ(B)
VR501 S	EVNM0AA00B53	Servo Gein Adjuster 5kΩ(B)
RELAY		
RL701	SFDYQ11N02	Muting
POWER TRANSFORMER		
TI 〔EX.XL〕⚠	SLT57DTE10E	Power Sourse
TI 〔XA〕⚠	SLT57DT11E	Power Sourse
TI 〔Other Area〕⚠	SLT57DT9E	Power Sourse
FUSE		
F1 〔XA〕only⚠	XBA2C016TR0	160mA, 250V
F2 〔XA〕only⚠	XBA2C06TR0	630mA, 250V
F2 〔Other Areas〕⚠	XBA2C06TR0	630mA, 250V

■ RESISTORS AND CAPACITORS

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. This " **S** " mark is service standard parts and may differ from production parts.
4. Unless otherwise specified.
   All resistors are in OHMS (Ω) K = 1000Ω, M = 1000kΩ
   All capacitors are in MICROFARADS (μF) P = μμF
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

ERG	1	AN	J	2R2
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	25 : 1/4W	J : ±5%
ERG : Metal Oxide	1 : 1W	G : ±2%

ERD2FCG□□□ ⟶ Fuse type carbon (1/4W)

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
ECKD	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Capacitor Type	Voltage		Tolerance
	ECEA Type	Others	
ECEA : Electrolytic	1A : 10V	1H : 50V DC	J : ±5%
ECEA...N : Non Polar Electrolytic	1C : 16V	2H : 500V DC	K : ±10%
ECKD : Ceramic	1E : 25V		Z : +80%, −20%
ECQM : Polyester	1V : 35V		P : +100%, −0%
ECEB : Electrolytic	1H : 50V		M : ±20%
ECCD : Ceramic	50 : 50V		

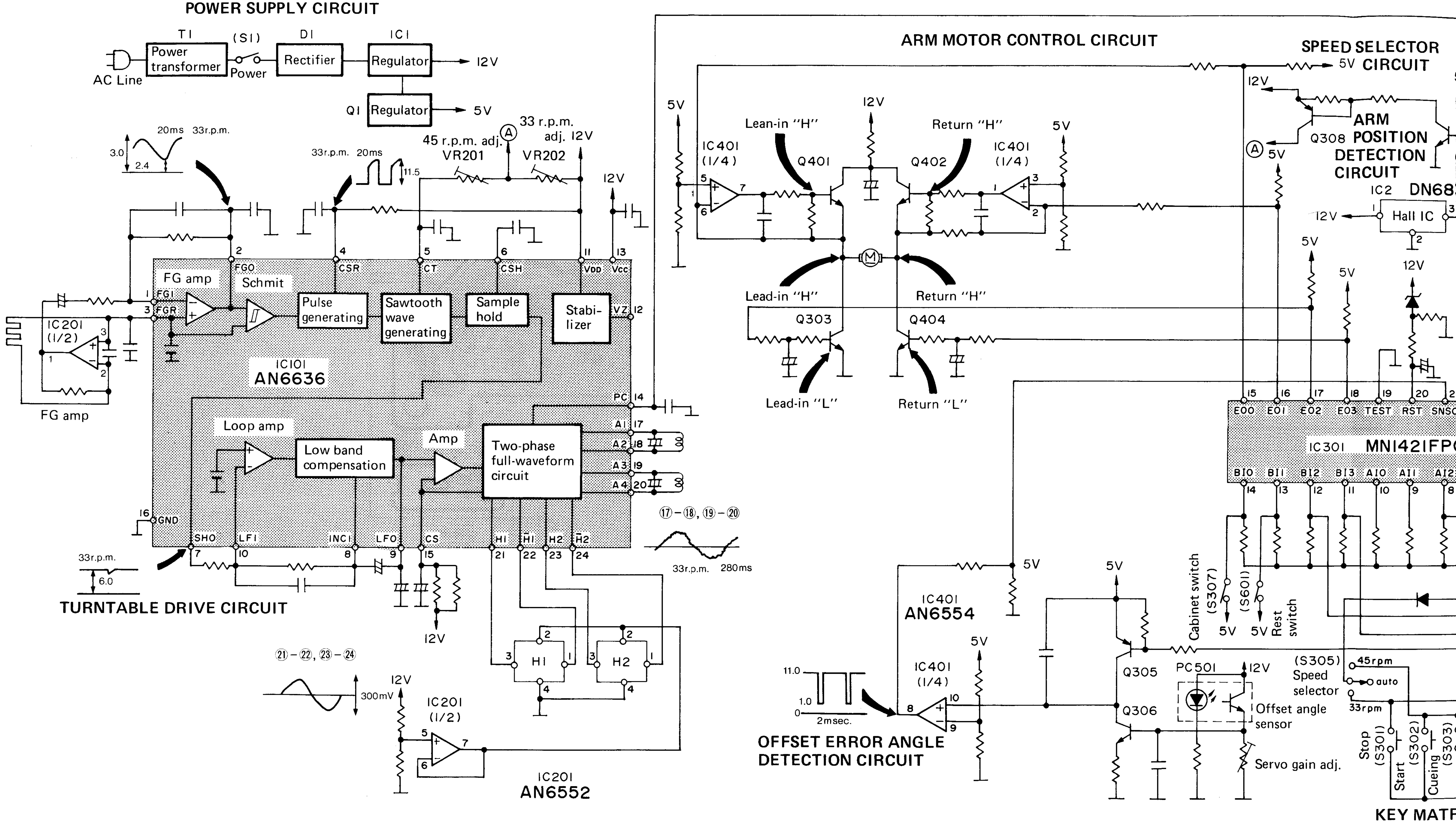
Ref. No.	Part No.	Value
RESISTORS		
R1 S	ERD25FJ681	680
R2 S	ERD25FJ221	220
R3 S	ERG1ANJ390	39
R101 S	ERD10TLJ150U	15
R102 S	ERX1ANJ1R8	1.8
R105	ERD10TLJ153U	15k
R106	ERD10TLJ223U	22k
R201	ERD10TLJ102U	1k
R202	ERD10TLJ153U	15k
R203	ERD10TLJ333U	33k
R204	ERD10TLJ104U	100k
R205	ERD10TLJ473U	47k
R206	ER010MKG1913	191k
R207	ER010MKG5622	56.2k
R221	ERD10TLJ102U	1k
R222	ERD10TLJ153U	15k
R301 S	ERD25TJ273	27k
R302,303 S	ERD25FJ102	1k
R304,305 S	ERD25FJ102	1k
R306 S	ERD25FJ471	470
R308 S	ERD25FJ331	330
R310 S	ERD25FJ562	5.6k
R313,314 S	ERD25TJ333	33k
R315,316 S	ERD25TJ333	33k
R317 S	ERD25FJ102	1k

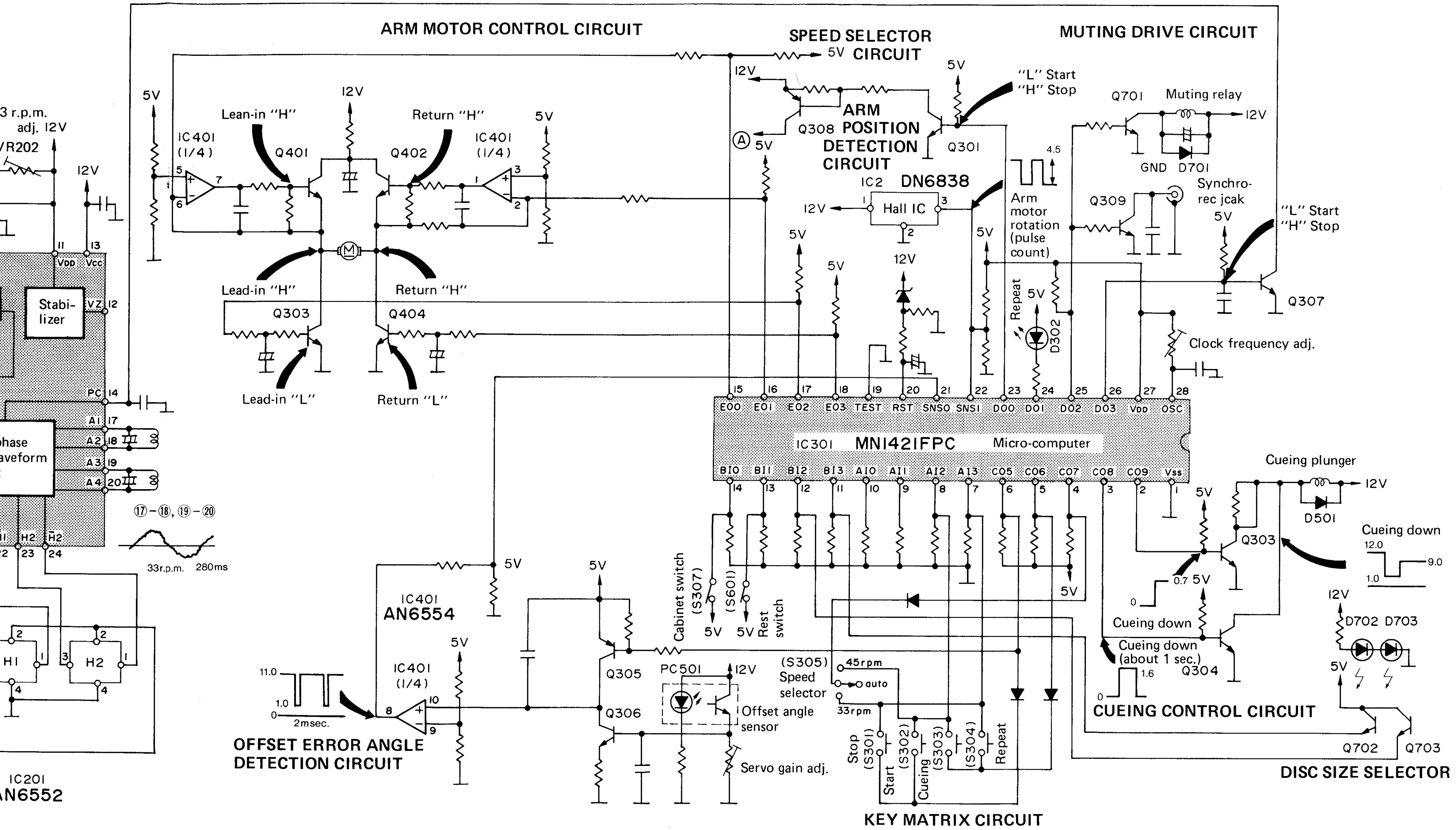
Ref. No.	Part No.	Value
RESISTORS		
R318,319 S	ERD25FJ332	3.3k
R320 S	ERD25FJ272	2.7k
R321,322 S	ERD25FJ331	330
R323 S	ERD25FJ562	5.6k
R324 S	ERD25TJ223	22k
R325 S	ERD25FJ103	10k
R326 S	ERD25FJ272	2.7k
R331 S	ERD25FJ102	1k
R332 S	ERD25FJ562	5.6k
R334	ERD25FJ222	2.2k
R335 S	ERD25FJ332	3.3k
R336 S	ERD25FJ562	5.6k
R337 S	ERD25FJ472	4.7k
R338 S	ERD25FJ471	470
R339 S	ERD25FJ472	4.7k
R340 S	ERD25TJ153	15k
R341 S	ERD25TJ473	47k
R342 S	ERD25FJ332	3.3k
R343 S	ERD25TJ473	47k
R345 S	ERD25FJ472	4.7k
R346 S	ERD25FJ471	470
R347 S	ERD25FJ102	1k
R348 S	ERD25FJ471	470
R349 S	ERD25FJ102	1k
R401,402 S	ERD25TJ683	68k

Ref. No.	Part No.	Value
RESISTORS		
R403 S	ERD25FJ472	4.7k
R404 S	ERD25FJ122	1.2k
R405 S	ERD25FJ222	2.2k
R406 S	ERD25FJ102	1k
R407 S	ERD25TJ224	220k
R408 S	ERD25FJ222	2.2k
R409 S	ERD25FJ102	1k
R410 S	ERD25TJ224	220k
R411 S	ERD25FJ272	2.7k
R412 S	ERD25FJ681	680
R413,414 S	ERD25FJ101	100
R415,416 S	ERD25FJ471	470
R501 S	ERD25FJ391	390
R502 S	ERD25FJ681	680
R503 S	ERD25FJ561	560
R701 S	ERD25FJ102	1k
RF1 ⚠	ERD2FCG180	18
CAPACITORS		
C1,2 S ⚠	ECKD1H223pF	0.022
C3 ⚠	ECQM1223KZ	0.022
C4 S	ECEB1VS222	2200
C5,6 S	ECQM1H104JZ	0.1
C101	ECUV1E333KB	0.033
C102,103 S	ECEA1CN470S	47

Ref. No.	Part No.	Value
CAPACITORS		
C104 S	ECEA1ES101	100
C105 S	ECEA1ES330	33
C201 S	ECEA50Z3R3	3.3
C202	ECQM1H104JZ	0.1
C203 S	ECQM1H333JZ	0.033
C205	ECUV1E473KB	0.047
C206 S	ECQM1H104JZ	0.1
C207 S	ECQM1H104JZ	0.1
C208 S	ECEA25Z4R7	4.7
C209	ECQM1H104JZ	0.1
C210 S	ECEA50ZR22	0.22
C212,213	ECUV1H102MD	0.001
C301 S	ECCD1H680K	68pF
C302 S	ECQM1H104JZ	0.1
C304 S	ECEA1AS470	47
C306 S	ECQM1H104JZ	0.1
C307 S	ECQM1H223JZ	0.022
C308 S	ECEA50Z3R3	3.3
C309	ECKD2H102PE	0.001
C401,402	ECQM1H223JZ	0.022
C403 S	ECEA1CS330	33
C404,405 S	ECEA1AS470	47
C601	ECFB1B104ZM	0.1
C701 S	ECEA1CS101	100

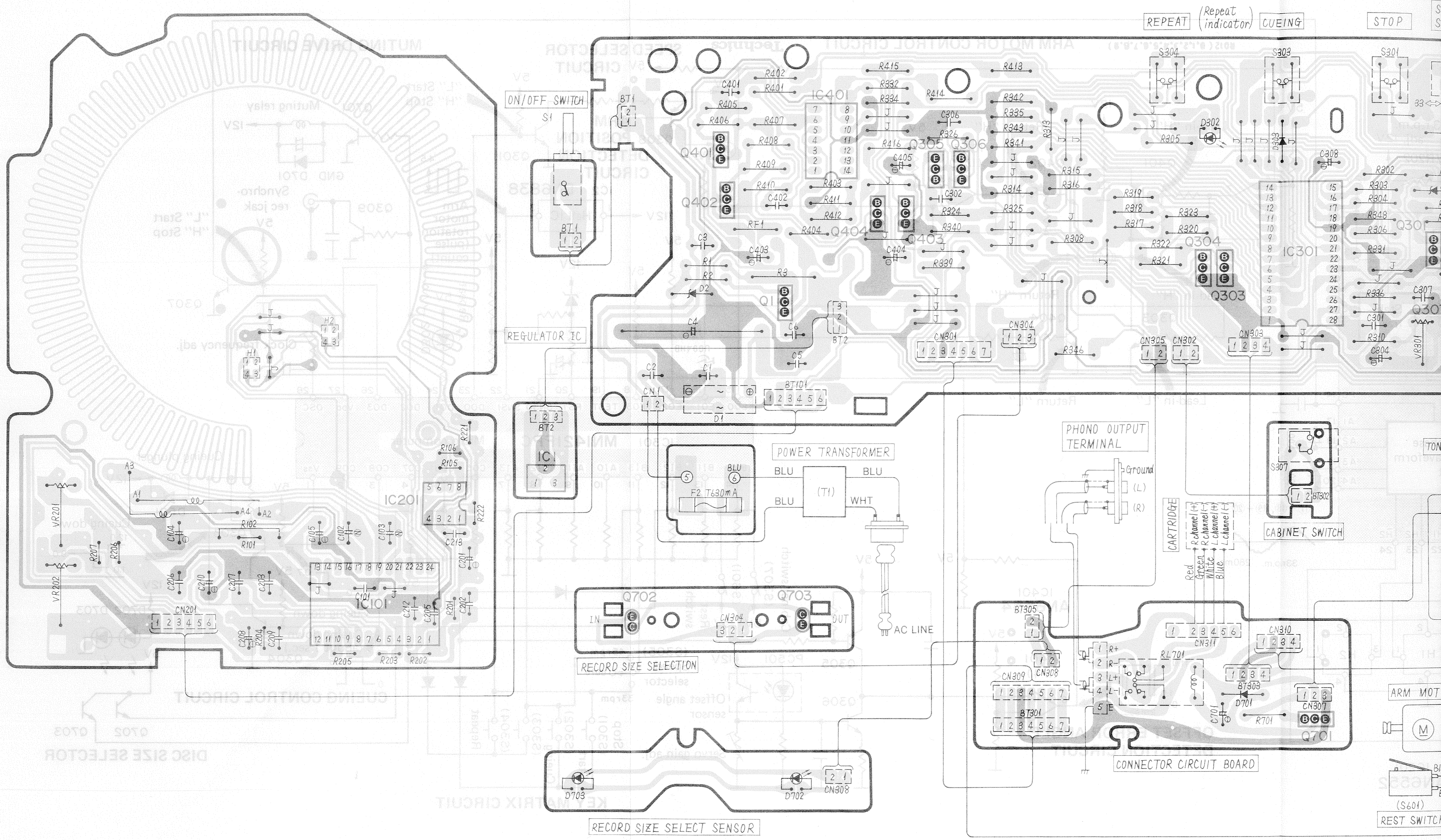
■ BLOCK DIAGRAM


POWER SUPPLY CIRCUIT
T1
(S1)
D1
IC1
AC Line
Power transformer
Power
Rectifier
Regulator
12V
Q1
Regulator
5V
ARM MOTOR CONTROL CIRCUIT
SPEED SELECTOR CIRCUIT
ARM POSITION DETECTION CIRCUIT
Q308
IC2 DN68
Hall IC
Lean-in "H"
Return "H"
Lead-in "H"
Lead-in "L"
Return "L"
IC401 (1/4)
Q401
Q402
Q303
Q404
20ms 33r.p.m.
3.0
2.4
33r.p.m. 20ms
11.5
45 r.p.m. adj. VR201
33 r.p.m. adj. VR202
FG amp
Schmit
Pulse generating
Sawtooth wave generating
Sample hold
Stabi-lizer
FGI
FGR
FGO
CSR
CT
CSH
VDD
Vcc
VZ
IC201 (1/2)
IC101
AN6636
PC
A1
A2
A3
A4
Loop amp
Low band compensation
Amp
Two-phase full-waveform circuit
GND
SHO
LFI
INC1
LFO
CS
H1
H̄1
H2
H̄2
⑰－⑱, ⑲－⑳
33r.p.m. 280ms
33r.p.m.
6.0
TURNTABLE DRIVE CIRCUIT
㉑－㉒, ㉓－㉔
300mV
IC201 (1/2)
IC201
AN6552
IC301 MN1421FP
E00 E01 E02 E03 TEST RST SNSC
B10 B11 B12 B13 A10 A11 A12
IC401
AN6554
Cabinet switch (S307)
(S601)
Rest switch
Q305
Q306
PC501
Offset angle sensor
Servo gain adj.
(S305) Speed selector
45rpm
auto
33rpm
Stop (S301)
Start (S302)
Cueing (S303)
KEY MATR
11.0
1.0
0
2msec.
OFFSET ERROR ANGLE DETECTION CIRCUIT

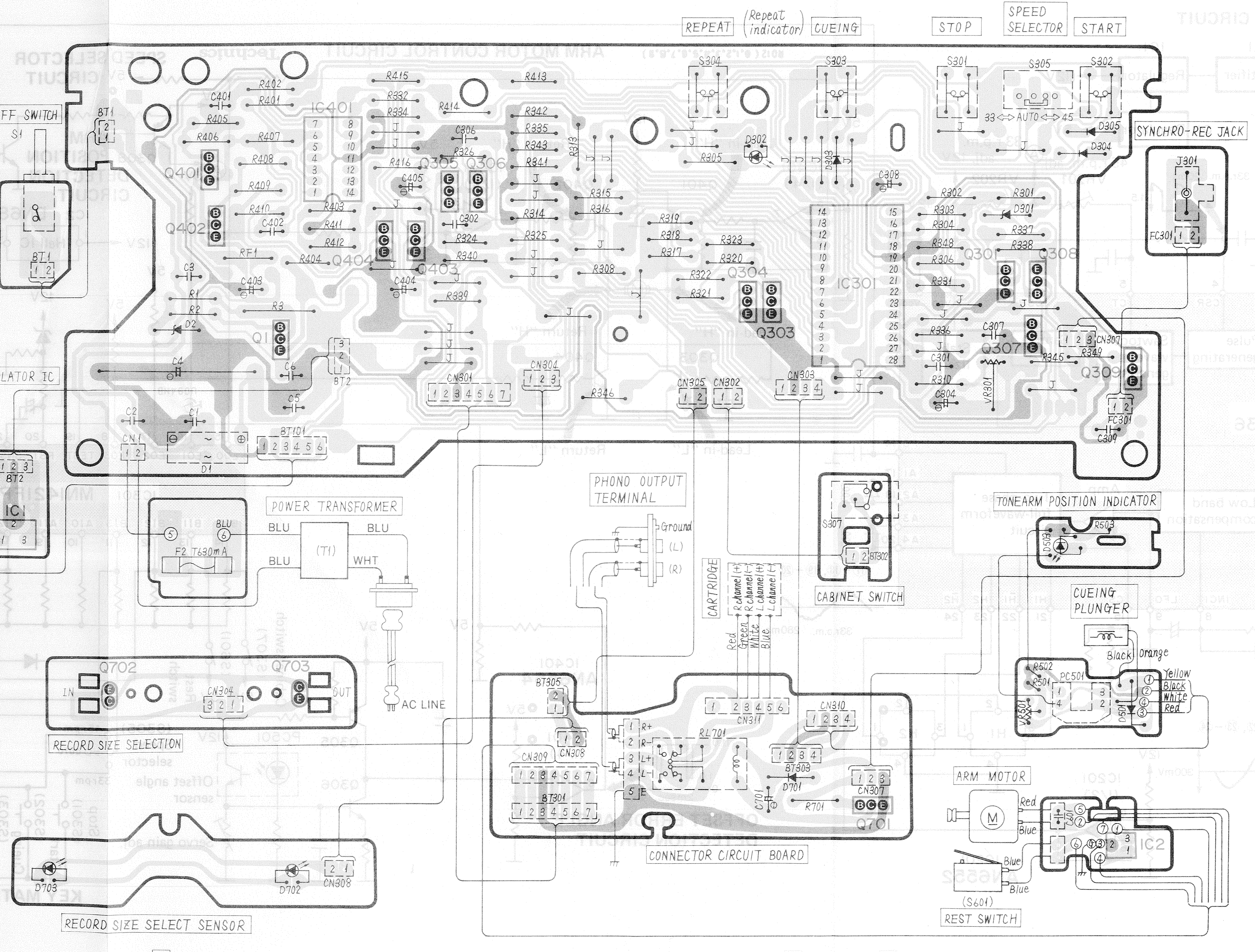

ARM MOTOR CONTROL CIRCUIT
SPEED SELECTOR CIRCUIT
MUTING DRIVE CIRCUIT
ARM POSITION DETECTION CIRCUIT
Q308
Q301
"L" Start
"H" Stop
Q701
Muting relay
12V
GND
D701
Q309
Synchro-rec jcak
IC2 DN6838
Hall IC
Arm motor rotation (pulse count)
4.5
Lean-in "H"
Return "H"
Lead-in "H"
Lead-in "L"
Return "L"
IC401 (1/4)
Q401
Q402
Q403
Q303
Q404
Repeat
D302
Q307
Clock frequency adj.
3 r.p.m. adj.
VR202
Stabilizer
VDD
Vcc
VZ
PC
A1
A2
A3
A4
H1
H2
phase waveform
⑰-⑱, ⑲-⑳
33r.p.m.
280ms
IC201
AN6552
E00 E01 E02 E03 TEST RST SNS0 SNS1 D00 D01 D02 D03 VDD OSC
IC301 MN1421FPC Micro-computer
B10 B11 B12 B13 A10 A11 A12 A13 C05 C06 C07 C08 C09 Vss
Cueing plunger
D501
Q303
Cueing down
12.0
9.0
1.0
0.7
Cueing down (about 1 sec.)
1.6
Q304
CUEING CONTROL CIRCUIT
D702 D703
Q702
Q703
DISC SIZE SELECTOR
Cabinet switch (S307)
(S601)
Rest switch
IC401 AN6554
IC401 (1/4)
11.0
1.0
2msec.
OFFSET ERROR ANGLE DETECTION CIRCUIT
Q305
Q306
PC501
Offset angle sensor
Servo gain adj.
(S305) Speed selector
45rpm
auto
33rpm
Stop (S301)
Start
(S302)
Cueing
(S303)
(S304)
Repeat
KEY MATRIX CIRCUIT
5V
12V

■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

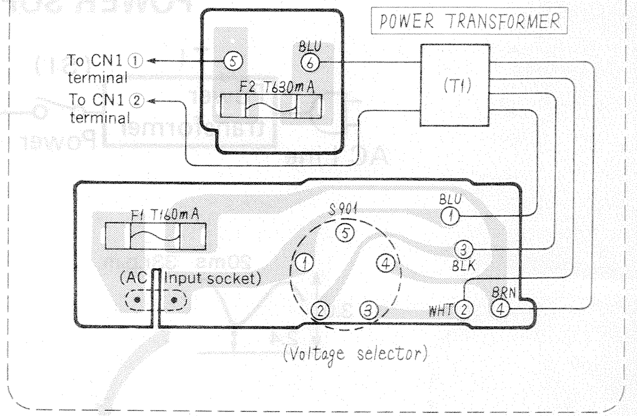
▨ Ground (Earth) lines


REPEAT
(Repeat indicator)
CUEING
STOP
S304
S303
S301
ON/OFF SWITCH
S1
BT1
REGULATOR IC
BT2
IC1
IC401
IC301
IC201
IC101
Q401
Q402
Q403
Q404
Q305
Q306
Q304
Q303
Q301
Q1
D2
D302
D303
D1
C401
C402
C403
C404
C405
C306
C302
C308
C307
C301
C304
C1
C2
C3
C4
C5
C6
R402
R401
R405
R406
R407
R408
R409
R410
R411
R412
R403
R404
R413
R414
R415
R416
R332
R334
R342
R335
R343
R341
R326
R324
R340
R339
R325
R314
R315
R316
R313
R308
R305
R319
R318
R317
R323
R320
R322
R321
R302
R303
R304
R348
R306
R331
R336
R310
R346
RF1
R1
R2
R3
VR301
CN1
BT101
CN301
CN304
CN305
CN302
CN303
H1
H2
A1
A2
A3
A4
VR201
VR202
R207
R206
R102
R101
C104
C105
C102
C103
C206
C210
C207
C213
C101
C212
C205
C201
C202
C215
R201
R106
R105
R221
R222
R205
R203
R202
C208
R204
C209
CN201
POWER TRANSFORMER
F2 T630mA
BLU
WHT
(T1)
AC LINE
PHONO OUTPUT TERMINAL
Ground
(L)
(R)
CARTRIDGE
R channel (+)
R channel (-)
L channel (+)
L channel (-)
Red
Green
White
Blue
S307
BT302
CABINET SWITCH
Q702
Q703
IN
OUT
CN304
RECORD SIZE SELECTION
D703
D702
CN308
RECORD SIZE SELECT SENSOR
BT305
CN311
CN310
CN308
CN309
BT304
RL701
BT303
D701
C701
R701
CN307
Q701
CONNECTOR CIRCUIT BOARD
ARM MOT
M
(S601)
REST SWITC
TON

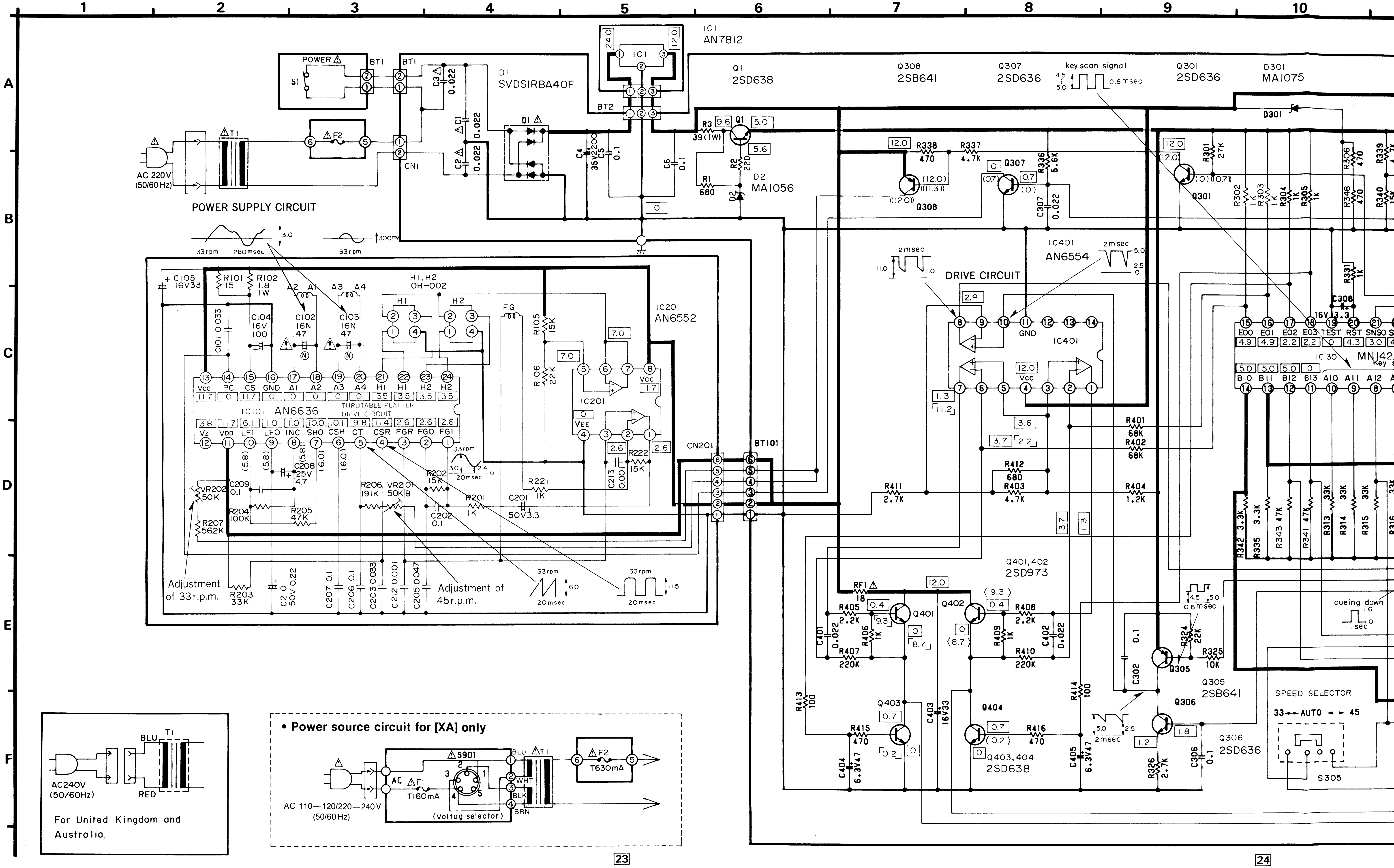
▨ Ground (Earth) lines


REPEAT
(Repeat indicator)
CUEING
STOP
SPEED SELECTOR
START
S304
S303
S301
S305
S302
33 ⟺ AUTO ⟺ 45
D305
D304
D302
D303
SYNCHRO-REC JACK
J301
FC301
IC401
IC301
Q401
Q402
Q403
Q404
Q305
Q306
Q304
Q303
Q301
Q308
Q307
Q309
Q1
BT1
BT2
BT101
CN1
D1
D2
RF1
VR301
CN801
CN304
CN305
CN302
CN303
CN307
FF SWITCH
S1
LATOR IC
IC1
POWER TRANSFORMER
BLU
WHT
(T1)
F2 T630mA
AC LINE
PHONO OUTPUT TERMINAL
Ground
(L)
(R)
CARTRIDGE
R channel (+)
R channel (−)
L channel (+)
L channel (−)
Red
Green
White
Blue
S307
BT302
CABINET SWITCH
TONEARM POSITION INDICATOR
R503
D503
CUEING PLUNGER
Black
Orange
R502
R501
PC501
VR501
D501
Yellow
Black
White
Red
ARM MOTOR
M
Red
Blue
IC2
Blue
Blue
(S601)
REST SWITCH
Q702
Q703
IN
OUT
CN304
RECORD SIZE SELECTION
D703
D702
CN308
RECORD SIZE SELECT SENSOR
BT305
CN308
CN309
BT304
RL701
CN311
CN310
BT303
D701
C701
R701
CN307
Q701
CONNECTOR CIRCUIT BOARD
B C E

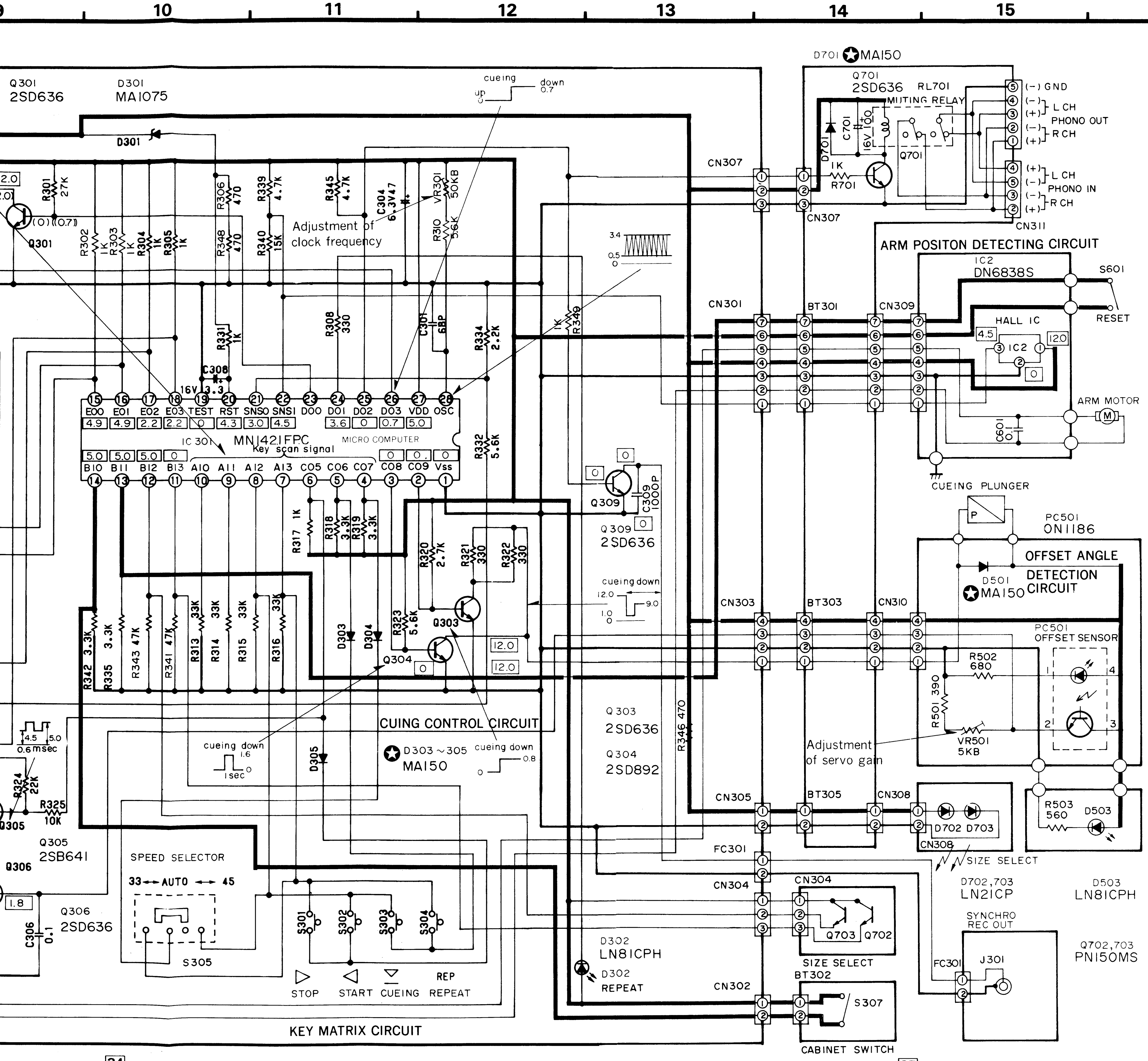
• Power source circuit for [XA] only.


To CN1 ① terminal
To CN1 ② terminal
POWER TRANSFORMER
BLU
F2 T630mA
(T1)
F1 T160mA
S901
(AC input socket)
BLK
WHT
BRN
(Voltage selector)

SCHEMATIC DIAGRAM



1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
POWER SUPPLY CIRCUIT
POWER
S1
BT1
BT2
CN1
T1
F2
AC 220V (50/60Hz)
C3 0.022
C1 0.022
C2 0.022
D1 SVDSIRBA40F
C4 35V2200
C5 0.1
C6 0.1
IC1 AN7812
Q1 2SD638
R3 39 (1W)
R1 680
R2 220
D2 MA1056
Q308 2SB641
Q307 2SD636
Q301 2SD636
D301 MA1075
key scan signal
0.6msec
R338 470
R337 4.7K
R336 5.6K
C307 0.022
R301 27K
R302 1K
R303 1K
R304 1K
R305 1K
R306 470
R348 470
R339
R340
R331 1K
C308
IC401 AN6554
DRIVE CIRCUIT
GND
Vcc
2msec
IC301 MN142
E00 E01 E02 E03 TEST RST SNSO
B10 B11 B12 B13 A10 A11 A12
Key
R401 68K
R402 68K
R412 680
R403 4.7K
R404 1.2K
R411 2.7K
R342 3.3K
R335 3.3K
R343 47K
R341 47K
R313 33K
R314 33K
R315 33K
R316
33rpm 280msec
33rpm 300m
IC201 AN6552
IC101 AN6636
TURUTABLE PLATTER DRIVE CIRCUIT
C105 16V33
R101 15
R102 1.8 1W
C101 0.033
C104 16V 100
C102 16N 47
C103 16N 47
A1 A2 A3 A4
H1, H2 OH-002
H1
H2
FG
R105 15K
R106 22K
Vcc PC CS GND A1 A2 A3 A4 H1 H1 H2 H2
Vz VDD LFI LFO INC SHO CSH CT CSR FGR FGO FGI
VEE
VR202 50K
R207 562K
C209 0.1
R204 100K
R205 47K
C208 25V 4.7
R206 191K
VR201 50KB
R202 15K
R201 1K
C202 0.1
C201 50V3.3
R221 1K
C213 0.001
R222 15K
CN201
BT101
Adjustment of 33r.p.m.
R203 33K
C210 50V 0.22
C207 0.1
C206 0.1
C203 0.033
C212 0.001
C205 0.047
Adjustment of 45r.p.m.
33rpm 20msec
Q401,402 2SD973
RF1 18
R405 2.2K
R406 1K
C401 0.022
R407 220K
Q401
Q402
R408 2.2K
R409 1K
C402 0.022
R410 220K
R413 100
Q403
R415 470
C404 6.3V47
C403 16V33
Q404
R416 470
Q403,404 2SD638
R414 100
C405 6.3V47
C302 0.1
R324 22K
R325 10K
Q305
Q306
Q305 2SB641
Q306 2SD636
R326 2.7K
C306 0.1
cueing down 1sec
SPEED SELECTOR
33 ↔ AUTO ↔ 45
S305
AC240V (50/60Hz)
BLU
RED
T1
For United Kingdom and Australia.
• Power source circuit for [XA] only
AC 110—120/220—240V (50/60Hz)
AC
F1 T160mA
S901
(Voltag selector)
BLU
WHT
BLK
BRN
F2 T630mA

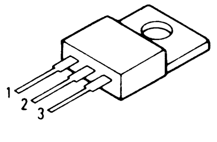
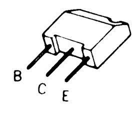
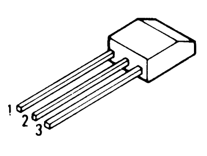
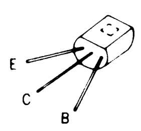
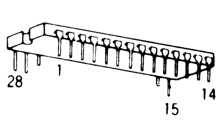
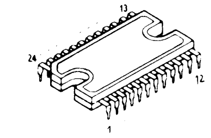
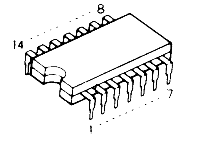
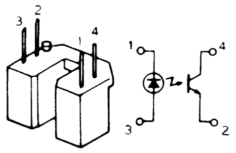
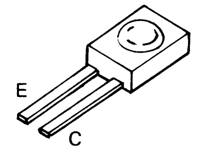

9
10
11
12
13
14
15
16
Q301 2SD636
D301 MA1075
D301
cueing up down 0.7
D701 MA150
Q701 2SD636
RL701 MUTING RELAY
C701 16V 100
D701
R701 1K
Q701
(−) GND
(−) (+) L CH
(+) (−) R CH
PHONO OUT
(+) (−) L CH
(−) (+) R CH
PHONO IN
CN307
CN311
R301 27K
R306 470
R339 4.7K
R345 4.7K
C304 6.3V47
VR301 50KB
R310 5.6K
Adjustment of clock frequency
R302 1K
R303 1K
R304 1K
R305 1K
R348 470
R340 15K
R308 330
C301 68P
R334 2.2K
R349 1K
R331 1K
C308 16V 3.3
ARM POSITON DETECTING CIRCUIT
IC2 DN6838S
S601
RESET
HALL IC
CN301
BT301
CN309
ARM MOTOR
C601 0.1
CUEING PLUNGER
E00 E01 E02 E03 TEST RST SNS0 SNS1 D00 D01 D02 D03 VDD OSC
IC 301 MN1421FPC MICRO COMPUTER
Key scan signal
B10 B11 B12 B13 A10 A11 A12 A13 C05 C06 C07 C08 C09 Vss
R332 5.6K
Q309
C309 1000P
Q309 2SD636
R317 1K
R318 3.3K
R319 3.3K
R320 2.7K
R321 330
R322 330
cueing down 12.0 9.0 1.0 0
PC501 ON1186
OFFSET ANGLE DETECTION CIRCUIT
D501 MA150
CN303
BT303
CN310
PC501 OFFSET SENSOR
R502 680
R501 390
VR501 5KB
Adjustment of servo gain
R323 5.6K
Q303
Q304
D303
D304
R342 3.3K
R335 3.3K
R343 47K
R341 47K
R313 33K
R314 33K
R315 33K
R316 33K
CUING CONTROL CIRCUIT
D303～305 MA150
cueing down 1.6 0 1sec
cueing down 0.8 0
Q303 2SD636
Q304 2SD892
R346 470
D305
4.5 5.0 0.6msec
R324 22K
R325 10K
Q305 2SB641
Q306 2SD636
C306 0.1
SPEED SELECTOR
33 AUTO 45
S305
S301 S302 S303 S304
STOP START CUEING REPEAT
REP
KEY MATRIX CIRCUIT
CN305
BT305
CN308
D702 D703
R503 560
D503
FC301
CN304
SIZE SELECT
Q703 Q702
D702,703 LN21CP
D503 LN81CPH
SYNCHRO REC OUT
J301
Q702,703 PN150MS
D302 LN81CPH
D302 REPEAT
CN302
BT302
S307
CABINET SWITCH

17 18 19

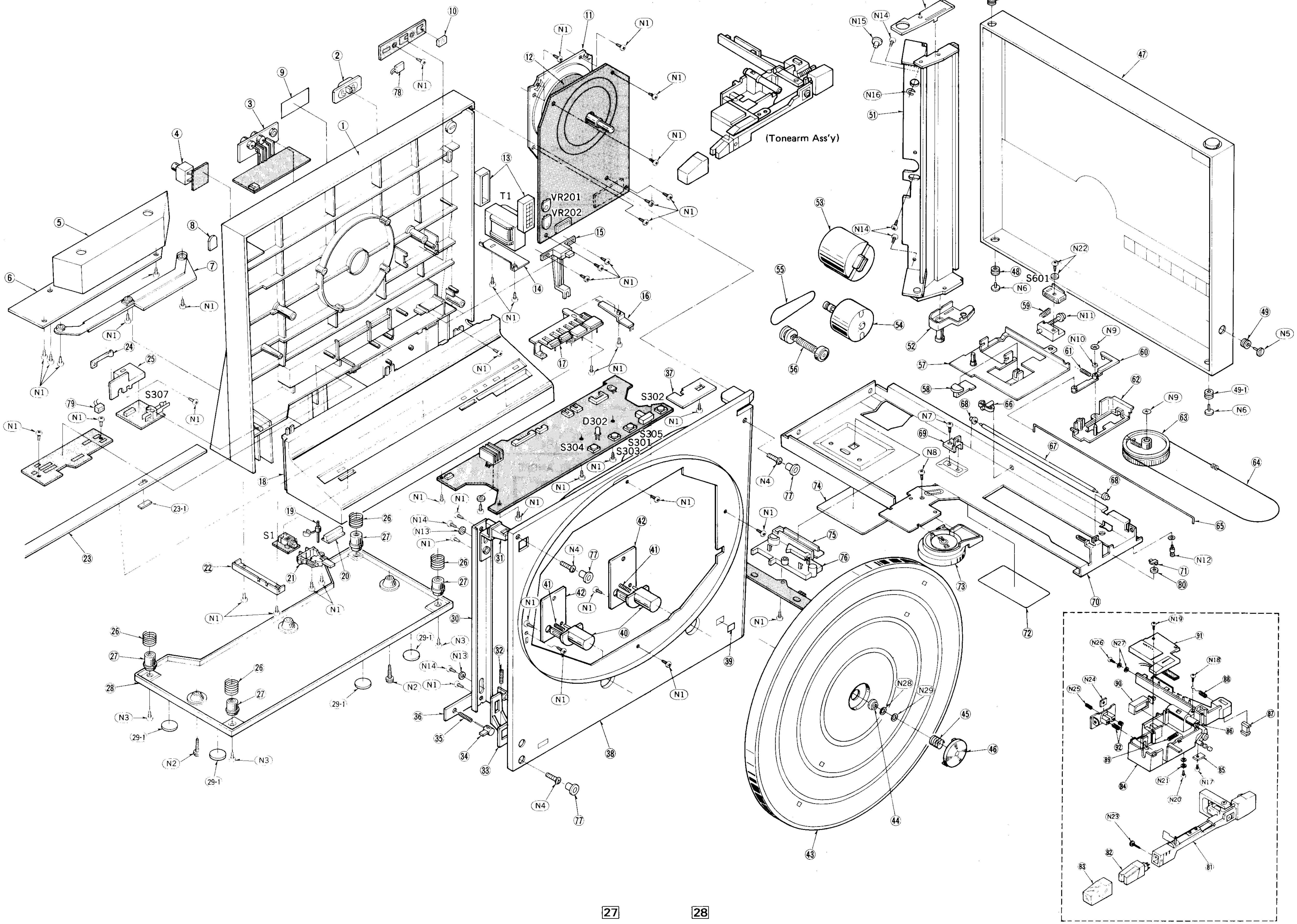
Notes:

1. **S1** : On/off (power) switch.
2. **S301** : Stop switch
3. **S302** : Start switch
4. **S303** : Cueing control switch
5. **S304** : Repeat switch
6. **S305** : Speed selector switch in "**auto**" position.
7. **S307** : Record detection switch.
   Presently a record is on turntable.
8. **S601** : Rest switch. Presently tonearm is on rest.
9. **S901** : Voltage selector in "**110-120V**" position.
10. The values in ☐ are the standard voltages measured by DC electro-voltmeter (high impedance) on the basis of chassis when the unit is in stop. So, some error might be included depending on the internal impedance of the measuring instrument and the set measured.
    - *( ): voltage in 33rpm. (Measured without turntable)
    - *(( )): voltage in 45rpm. (Measured without turntable)
    - *⌜ ⌟: voltage when tonearm is in lead-in.
    - *〈 〉: voltage when tonearm is in return.
11. ▬ : +B voltage lines.
12. Part No. with ✪ mark are not identical between regular part No. and repair part No. supplied.
    So, when placing an order for repair parts, use the part No. in the replacement parts list of repair parts.
13. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

• Terminal guide of transistors, photo interrupters and IC's.

AN7812 	2SD638, 2SD636 2SB641, 2SD973 
DN6838S 	2SD892 
MN1421FPC 	AN6636 
AN6552 AN6554 	ON1186 
PN150MS 	

■ EXPLODED VIEW


(Tonearm Ass'y)
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■ REPLACEM

Notes: 1. Part numbers are
this part number
2. Important safety
Components ind
important for sa
use only manufa

Ref. No.		Part No.
CABINET and CHASSIS		
1	○	SFACV05N01
1	🅺	SFACV05N21
2	(XL)only⚠	SFDJHSC049
2	(Other Areas)⚠	SFDJHSC049
3		SFDJV05N09
4		SFDJC06N02
5		SFUPV05N06
6		SFUMV05N16
7		SFUMV05N17
8		SFUMV05N30
9	(EK・XL)	SFNNV05G01
9	(XA)	SFNNV05X01
9	(E)(EC)	SFNNV05S01
9	(Other Areas)	SFNNV05R01
10		SFUMLIIN02
11		SFMZV05N03
12		SFMGQ34N01
13		SFGCV05N03
14		SFUPV05N07
15		SFKTV05N03
16		SFUMV05N04
17		SFKTV05N02
18	○	SFUMV05N01
18	🅺	SFUMV05N31
19		SFXJV05N01
20		SFKTV05N01
21		SFUMV05N18
22		SFUPV05N08
23	○	SFKKV05N01
23	🅺	SFKKV05N21
23−1		SFUPV05N11
24		SFQPC05N01
25		SFUMV05N07
26		SFQAV05N03
27		SFGAV05N01

■ REPLACEMENT PARTS LIST...Cabinet & Chassis Parts

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
   Components indentified by ⚠ make have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ-marked parts are used for black type only, while ○-marked parts are for silver type only.
4. Parts other than Ⓚ and ○-marked are used for both black and silver types.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

CABINET and CHASSIS PARTS

Ref. No.	Part No.	Description
1 ○	SFACV05N01	Cabinet(Silver Type) (1)
1 Ⓚ	SFACV05N21	Cabinet(Black Type) (1)
2 〔XL〕only⚠	SFDJHSC0491	Socket, AC Power (1)
2 〔Other Areas〕⚠	SFDJHSC0498	Socket, AC Power (1)
3	SFDJV05N09E	Terminal, Phono Output (1)
4	SFDJC06N02	Jack, Synchro−rec (1)
5	SFUPV05N06	Weight (1)
6	SFUMV05N16	Cover, Weight (1)
7	SFUMV05N17	Cover, Socket, Jack & Tarminal (1)
8	SFUMV05N30	Cover (1)
9 〔EK・XL〕	SFNNV05G01	Name Plate (1)
9 〔XA〕	SFNNV05X01	Name Plate (1)
9 〔E〕〔EC〕	SFNNV05S01	Name Plate (1)
9 〔Other Areas〕	SFNNV05R01	Name Plate (1)
10	SFUMLIIN02	Holder, L. E. D. (2)
11	SFMZV05N03A	Stator Frame (1)
12	SFMGQ34N01	Cover, F. G. Coil (1)
13	SFGCV05N03	Cushion Rubber, Power Transformer (2)
14	SFUPV05N07	Plate, Power Transformer (1)
15	SFKTV05N03	Knob, Speed Selector (1)
16	SFUMV05N04	Lever, Speed Selector (1)
17	SFKTV05N02	Knob Ass'y, Key Switch (1)
18 ○	SFUMV05N01	Cover, Control knob(Silver Type) (1)
18 Ⓚ	SFUMV05N31	Cover, Control knob(Black Type) (1)
19	SFXJV05N01E	Joint Ass'y, On/off Switch (1)
20	SFKTV05N01	Knob, On/off Switch (1)
21	SFUMV05N18	SWitch Base, On/off Switch (1)
22	SFUPV05N08	Bracket, Cabinet & Cabinet Cover (2)
23 ○	SFKKV05N01	Surface Plate (Silve Type) (1)
23 Ⓚ	SFKKV05N21	Surface Plate (Black Type) (1)
23−1	SFUPV05N11	Filter, Surface Plate (1)
24	SFQPC05N01	Spring, Cabinet Switch (1)
25	SFUMV05N07	Cover, Cabinet Switch (1)
26	SFQAV05N03	Spring, Audio Insulator (4)
27	SFGAV05N01	Audio Insulator (4)
28	SFUPV05N09	Bottom Board (1)
29−1	SFGAV05N02	Cushion Rubber (4)
30	SFUPV05N03	Rod, Open/close Front Cabinet (1)
31	SFUMV05N02	Lever, Open/Close Front Cabinet (1)
32	SFQHV05N01	Spring, Open/close Front Cabinet (1)
33	SFUMV05N11	Lever, Open/close Front Cabinet (1)
34	SFUMV05N03	Shutter Open/close Front Cabinet (1)
35	SFQAV05N01	Spring, Shutter (1)
36	SFUMV05N27	Plate, Shutter (1)
37	SFUMV05N26	Plate, Main P. C. B. (1)
38	SFUMV05N10	Cover, Cabinet (1)
39	SFNZV05N03	Label, Speed Selector (1)
40	SFUMV05N13	Record Guide (2)
41	SFQAV05N02	Spring, Record Guide (2)
42	SFUMV05N14	Plate, Record. Guide (2)
43	SFTEV05N01E	Turntable Pllater Ass'y, (with Turntable MaT) (1)
44	SFUMV05N15	Cam, Turntable Pllater (1)
45	SFQAC06N01	Spring, E. P. Adaptor (1)
46	SFWEV05N01	E. P. Adaptor,45r. p. m. (1)
47 ○	SFADV05N01Z	Dust Cover Ass'y, (Silver Type) (1)
47 Ⓚ	SFADV05N21Z	Dust Cover Ass'y, (Black Type) (1)
48 ○	SFGCV05N01	Cushion Rubber, Dust Cover(Silver Type) (2)
48 Ⓚ	SFGCV05N21	Cushion Rubber, Dust Cover(Black Type) (2)
49 ○	SFGCV05N02	Cushion Rubber, Dust Cover(Silver Type) (1)
49 Ⓚ	SFGCV05N22	Cushion Rubber, Dust Cover(Black Type) (1)
49−1 ○	SFGCV05N04	Cushion Rubber, Dust Cover(Silver Type) (1)
49−1 Ⓚ	SFGCV05N24	Cushion Rubber. Dust Cover(Black Type) (1)
50	SFUMV05N05	Upper Cover, Hinge (1)
51	SFUPV05N05Z	Hinge (1)
52	SFUMV05N06	Lower Cover, Hinge (1)
53	SFUMC02N07	Cover, Tonearm Motor (1)
54	SFMHC02N01E	Motor Ass'y, Tonearm Drive (1)
55	SFGBC10−01	Belt, Tonearm Drive (1)
56	SFUML11R02A	Worm Gear Ass'y (1)
57	SFUPC02N10E	Plate Ass'y, Motor (1)
58	SFUMC02N10	Lope Guide (1)
59	SFQA913−01	Spring, Rest Switch Adjuster (1)
60	SFUMC02N05	Lever Ass'y, Rest Switch (1)
61	SFQHQ34N22	Spring, Rest Switch Lever (1)
62	SFUMC02N13	Plate Ass'y, Rest Switch (1)
63	SFUML11R03	Arm Drive Wheel (1)
64	SFUZC05N02E	Arm Drive Lope Ass'y (1)
65	SFUZC02N01	Rod, Rest Switch (1)
66	SFEZQ34N01	Clamper, Lead Wires (1)
67	SFXJC02N03	Guide Rail, Tonearm Drive (1)
68	SFGCC05N05	Cushion Rubber, Guide Rail (2)
69	SFUPC02N03	Bracket, Guide Rail (1)
70	SFUKV05N01E	Plate Ass'y, Tonearm (1)
71	SFUMC06N11	Cap, Pulley (1)
73	SFUMV05N12E	Stabilizer (1)
74	SFNZV05M01	Caution Label (1)
75	SFUMV05N09	Disk Size Selector (1)
76	SFUMV05N08	Spacer, Disc Size Selector (1)
77	SFXGV05N01	Cap, Cabinet Cover (3)
78	SFDJV05N11E	Connector Ass'y, 3P CN304 (1)
79	SFDJV05N01E	Connector Ass'y, 2P CN302 (1)
	SFDJV05N06E	Connector Ass'y, 3P (1)
	SFDJ109N13E	Connector Ass'y, 6P (1)
	SFDJV05N04E	Connector Ass'y 2P (1)
	SFDJV05N05E	Connector Ass'y 2P (1)
	SFDJV05N07E	Connector Ass'y 4P (1)
	SFDJV05N08E	Connector Ass'y 7P (1)
80	SFUMC05N22	Pulley (1)

TONEARM PARTS

Ref. No.	Part No.	Description
81	SFPAM0V501A	Tonearm Ass'y (1)
82	EPC−P24S	※Cartridge (1)
	EPS−24CS	※Stylus (1)
83	SFCNC02301	Cover, Stylus (1)
84	SFPKD00301R	Base Ass'y, Tonearm (1)
85	SFPZB00301	Plate (1)
86	SFPJU00301	Bracket, Guide Rail (1)
87	SFPGML1101	Rubber (1)
88	SFPSP0V501	Spring, Lead Wires (1)
89	SFPSP00504	Spring (1)
90	SFDZC05N01E	Cueing Plunger (1)
91	SFPCS0V501E	Cover, Tonearm Position Indicator (1)
92	SFPCS00302	Spring (2)

SCREWS, WASHERS and CIRCLIPS

Ref. No.	Part No.	Description
N1 S	XTV3+10BFN	Screw (44)
N2 S	SFXGD20−01	Screw (2)
N3 S	XTV3+10GFYR	Screw (3)
N4 S	XTV3+14BFN	Screw (3)
N5 ○	SFXGV05N03	Screw (Silver) (1)
N5 Ⓚ	SFXGV05N06	Screw (Black) (1)
N6	SFXGV05N02	Screw (3)
N7 S	XTV3+6BFN	Screw (1)
N8 S	XTV3+8B	Screw (1)
N9	CSTW3	Washer (2)
N10 S	XWE3	Washer (1)
N11	SFXGV05N01	Screw (1)
N12	SFXWC10−03	Screw (1)
N13 S	XWE3	Washer (2)
N14	XTW3+10Q	Screw (4)
N15	SFXJV05N03	Screw (1)
N16	SFXW130−01	Washer (1)
N17 S	XTN2+4B	Screw (1)
N18 S	XTN3+8BFZ	Screw (1)
N19 S	XTN26+6BFZ	Screw (1)
N20 S	XSN2+4	Screw (1)
N21 S	XWA2B	Washer (1)
N22	XTN16+10G	Screw (1)
N23	SFPEV00502	Screw (1)
N24	SFXN623−1	Nut (1)
N25	XXE3D10FZS	Screw (1)
N26 S	XSN3+12S	Screw (1)
N27 S	XWA3B	Washer (1)
N28	SFXWV05N02	Washer (1)
N29 S	XUC6FT	Washer (1)

ACCESSORIES

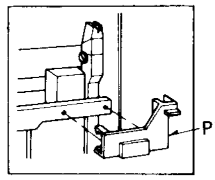
Ref. No.	Part No.	Description
A1 〔EK〕	SFNUV05G01	Instruction Book (1)
A1 〔EG〕	SFNUV05R01	Instruction Book (1)
A1 〔EF〕	SFNUV05F01	Instruction Book (1)
A1 〔EI〕	SFNUV05I01	Instruction Book (1)
A1 〔XA〕	SFNUV05X01	Instruction Book (1)
A1 〔Other Areas〕	SFNUV05S01	Instruction Book (1)
A2	SFDHC05N01	Phono Cord (1)
A3	SFDLC05N01	Ground Wire (1)
A4 〔XL〕S⚠	RJA26Z	AC Cord (1)
A4 〔EK〕S⚠	RJA43Z	AC Cord (1)
A4 〔XA〕S⚠	QFC1103	AC Cord (1)
A4 〔Other Areas〕 S⚠	RJA20Z	AC Cord (1)

PACKING PARTS

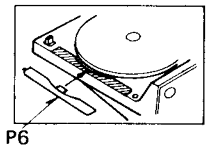
Ref. No.	Part No.	Description
P1 〔EF〕○	SFHPV05C01	Carton Box, (Silver Type) (1)
P1 〔EF〕Ⓚ	SFHPV05C21	Carton Box, (Black Type) (1)
P1 〔Other Areas〕○	SFHPV05M01	Carton Box, (Silver Type) (1)
P1 〔Other Areas〕Ⓚ	SFHPV05M21	Carton Box, (Black Type) (1)
P2	SFHHV05N01	Pad, Left (1)
P3	SFHHV05N02	Pad, Right (1)
P4	SFHKV05N02	Clamper, Turntable Platter (2)
P5	XSN4+70FYBS	Screw, Clamper (2)
P6	SFHSV05N01	Spacer, Dust Cover (1)
P7	SFHKV05N01	Spacer, Tonearn (1)
P8	SFYH52×60	Polyethylene Bag, Cord (1)
P9	SFYH17×16	Polyethylene Bag, Unit (1)

■ PACKINGS

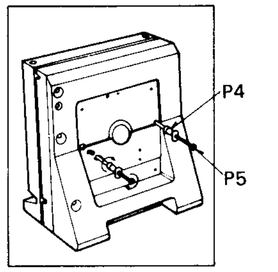
1. Open the cabinet and fit the spacer for tonearm protection in place.



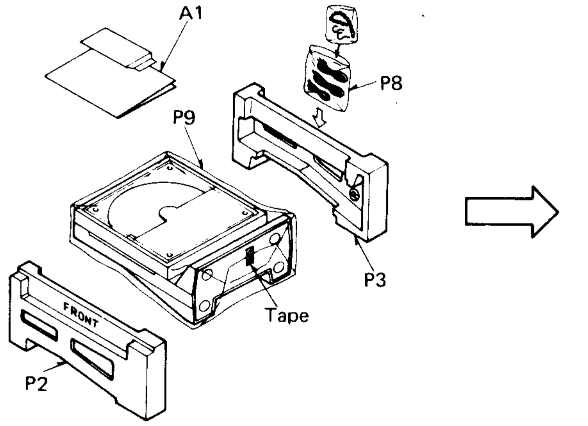
2. Fit the dust cover spacer.

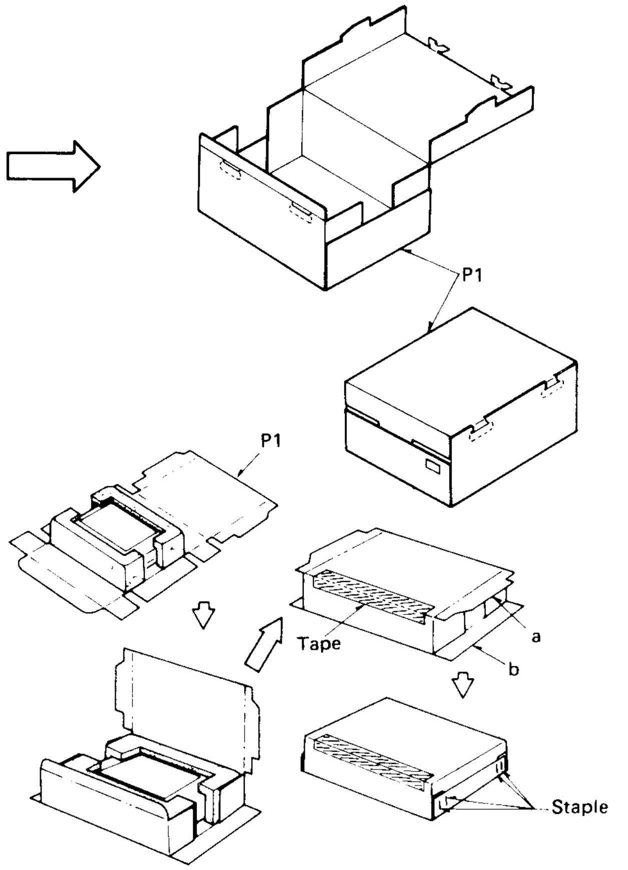


3. Fit the turntable clamper.



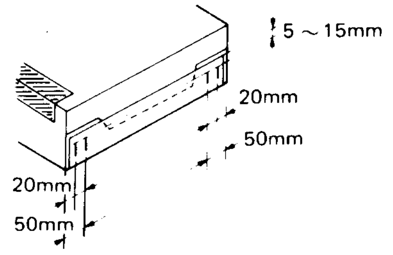
4. Put the set into the polyethylene bag, then pack it as shown below.





5. Plase the unit (with cushions attached) as illustrated.
6. Fold the flaps according to the line marks.
7. Seal the top with adhesive tape.
   *Use gum tape or adhesive cloth tape of 50 mm wide at least.
8. For the edges, first fold the flap "a" and then flap "b", and staple. Remember to staple only flap "b". (Use 15 or 16 mm staple)

* Stapling positions are shown below.



Printed in Japan
83026400 Ⓗ YW

ORDER NO. SD83022410C8-A

Direct Drive Automatic Turntable System

SL-V5

This booklet contains the specifications and adjusting procedures for SL-V5, written in Germany, French and Spanish. File this manual together with the SL-V5 service manual (Order No. SD83022410C8).

DEUTSCH

■ TECHNISCHE DATEN

Änderungen der technischen Daten vorbehalten.
Die angegebenen Gewichts- und Abmessungsdaten sind ungefähre Werte.

■ Allgemeine Daten

Stromversorgung:	~220 V 50 Hz Wechselstrom
Leistungsaufnahme:	13 W
Abmessungen: (B×H×T)	31,5 × 37,2 × 18,5 cm
Gewicht:	6,2 kg

■ Plattenspieler

Typ:	Auto-Start/Auto-Zuführung Rückführautomatik Stopp-Automatik Wiederhol-Betrieb Automatische Drehzahlwahl Manuelle Drehzahlwahl möglich Automatische Plattengrößewahl Plattenpräsenz-Registrierung
Antrieb:	Direktantrieb
Motor:	Kollektorloser Gleichstrommotor
Plattenteller:	Aluminium-Druckguß Durchmesser 30 cm
Plattenteller-Drehzahlen:	33-1/3 und 45 U/min
Gleichlaufschwankungen:	0,012% WRMS* 0,025% WRMS (JIS C5521) ±0,035% Spitze (IEC 98A bewertet)

* Gemessen anhand von Signalen vom eingebauten Frequenzgenerator des Motorbauteils.

Rumpel-Fremdspannungsabstand:	−56 dB (IEC 98A unbewertet)
Rumpel-Geräuschspannungsabstand:	−78 dB (IEC 98A bewertet)

■ Tonarm

Typ:	Dynamisch ausbalancierter Tangential-Tonarm mit Kardanaufhängung mit 4-Punkt-Drehlager
Effektive Länge:	10,5 cm
Spurfehlwinkel:	Innerhalb ±0,1°
Effektive Masse:	9 g (einschließlich Tonabnehmer)
Resonanzfrequenz:	12 Hz
Tonarm-Antriebsmotor:	Gleichstrommotor

■ Tonabnehmer

Typ:	Stereo-Magnet-Tonabnehmer
Magnetkreis:	Ganzlamellenkern
Frequenzgang:	10 Hz bis 30 kHz 20 Hz bis 10 kHz ±1 dB
Ausgangsspannung:	2,5 mV bei 1 kHz 5 cm/s. Null-zu-Spitze, lateral [7 mV bei 1 kHz 10 cm/s. Null-zu-Spitze, 45° (DIN 45 000)]
Kanaltrennung:	22 dB bei 1 kHz
Kanalabweichung:	Innerhalb 2 dB bei 1 kHz
Empfohlene Endimpedanz:	47 kΩ ~ 100 kΩ
Nachgiebigkeit (dynamisch):	12 × 10^{-6} cm/dyn bei 100 Hz
Auflagekraft-Einstellbereich:	1,25 ±0,25 g (12,5 ±2,5 mN)
Gewicht:	6 g (nur Tonabnehmer)
Ersatznadel:	EPS-24CS

■ JUSTIERUNGEN

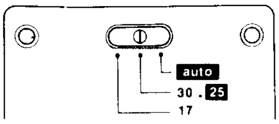
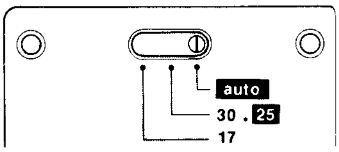
- **Verwendete Geräte und Zustand des Gerätes**

1. Oszilloskop
2. Gleichstrom-Voltmeter
3. 30 cm-Schallplatte
4. Schraubenzieher
5. Sechskant-Gestängeschlüssel (M3)

Schritt	Posten	Vorbereitungen	Zu justierende Teile	Vorgehen
1	**Start-Position**	1. Eine 30 cm-Platte auflegen und das Vorderteil des Gehäuses schließen. 2. Den Netzschalter einschalten. 3. Den Start-Schalter drücken.	Startpositions-Justierungs-schraube (Abb. 21)	1. Vorderteil des Gehäuses öffnen. 2. Falls die Abtastnadel zwischen Musikstücken aufsetzt, durch Drehen der Schraube entgegen dem Uhrzeigersinn justieren. 3. Falls die Abtastnadel außerhalb der Platte aufsetzt, durch Drehen der Schraube im Uhrzeigersinn justieren.

Schritt	Posten	Vorbereitungen	Zu justierende Teile	Vorgehen
2	**Tonarmwinkel**	1. Das Vorderteil des Gehäuses öffnen. 2. Den Netzschalter einschalten. 3. Den Start-Schalter drücken, um den Tonarm nach innen zu bewegen, und dann den Netzschalter ausschalten.	Tonarmwinkel-Justierschraube (Abb. 23)	1. Die Tonarmwinkel-Justierschraube so drehen, daß die Tonarmmitte mit der V-Kerbe der Liftstange übereinstimmt.
3	**Servo-Verstärkung**	1. Das Voltmeter an den CN-Anschluß CN303 (+) und②(−) der Hauptleiterplatte anschließen. (Abb. 22) 2. Den Netzschalter einschalten.	VR501 (Abb. 24)	1. Den Tonarm vollständig nach rechts bewegen. 2. VR501 so justieren, daß die Ausgangsspannung 3,6V beträgt.
4	**Offset-Spannung**	1. Gleichstrom-Voltmeter an CN303, Anschluß③(+) und (−) der Hauptleiterplatte anschließen. (Abb. 22) 2. Den Netzschalter einschalten.	Offsetspannungs-Justierschraube (Abb. 24)	1. Den Tonarm zur Mitte bewegen. 2. Die Justierschraube so drehen, daß die Ausgangsspannung 1,8V beträgt. (Sechskant-Gestängeschlüssel verwenden.)
5	**Taktgeber-Frequenz**	1. Q1 Emitter mit IC301, Stift ⑭ verbinden. (Abb. 22) 2. Oszilloskop IC301, Stift ⑬ verbinden.	VR301 (Abb. 22)	1. Den Netzschalter einschalten. 2. VR301 justieren, so daß der Ausgangswellenform-Zyklus 30μs ± 1μs beträgt.
6	**Drehzahl**	1. Vorderteil des Gehäuses öffnen und die Platte auflegen. 2. Das Stroboskop einschalten. 3. Vorderteil des Gehäuses schließen.	VR201 (45 U/min.) VR202 (33 U/min.)	1. Den Netzschalter einschalten. 2. Den Drehzahl-Wahlschalter auf "45" einstellen. 3. VR201 so justieren, daß die Drehzahl dem Sollwert (45 U/min.) entspricht. 4. Den Drehzahl-Wahlschalter auf "33" einstellen. 5. VR202 so justieren, daß die Drehzahl dem Sollwert (33 1/3 U/min.) entspricht. **Anmerkung:** Unbedingt zuerst die Justierung für 45 U/min. vornehmen.

- **Beim Abspielen nachstehender Plattentypen ist es möglich, daß der Plattenspieler nicht normal funktioniert. Dies stellt jedoch dein fehlerhaftes Funktionieren des Plattenspielers dar. Folgen Sie in solchen Fällen den nachstehenden Hinweisen.**

Schallplatte		Bedienung	Anmerkungen
■ **25 cm-Platten.**  		1. Stellen Sie den Schallplattengrößenwähler in die "30. 25 " Position. 2. **Halten Sie den Start-Start-Schalter gedrückt, damit sich der Tonarm bis zu einem Punkt über der Einlaufrille der Platte bewegt.** 3. Drücken Sie die Liftsteuerung.	• Normalerweise sollte der Schallplattengrößenwähler in der "auto"-Stellung gelassen werden.  • **Wiederholtes Abspielen ist nicht möglich für 25 cm-Platten oder solche Platten, die nicht den Industrienormen entsprechen, da die Größe nicht automatisch erfaßt wird.** • **Stellen Sie den Drehzahl-Wahlschalter auf 33 oder 45 ein, entsprechend der erforderlichen Drehzahl für die abzuspielende Platte.** • **In gewissen Fällen könnte es unmöglich sein, Platten abzuspielen, deren Abmessungen nicht den Industrienormen entsprechen.**
■ **Platten, die transparent, farbig oder durchsichtig schwarz sind-d.h. alle Platten, die Licht nicht vollständig blockieren.**	30 cm-Platten	1. Stellen Sie den Schallplattengrößenwähler in die "30. 25 " Position. 2. Mit automatischer oder Suchspiel-Betriebsart verwenden.	
	17 cm-Platten	1. Stellen Sie den Schallplattengrößenwähler in die "17" Position. 2. Mit automatischer oder Suchspiel-Betriebsart verwenden.	

FRANÇAIS

■ CARACTERISTIQUES

Les spécifications sont susceptibles d'être modifiées sans préavis.
Le poids et les dimensions donnés sont approximatifs.

■ Généralités

Alimentation:	~220 V 50 Hz
Consommation:	13 W
Dimensions: (L×H×P)	31,5 × 37,2 × 18,5 cm
Poids:	6,2 kg

■ Platine de lecture

Type:	Platine automatique Départ automatique/Entrée automatique Retour automatique Arrêt automatique Auditon répétée Sélection de vitesse automatique Sélection automatique du diamètre Sélection de vitesse manuelle possible Détection de la présence d'un disque
Système d'entraînement:	Entraînement direct
Moteur:	Moteur C.C. sans balai
Plateau de lecture:	Aluminium moulé sous pression Diamètre 30 cm
Vitesses de la platine:	33-1/3 et 45 t/p.m.
Pleurage et scintillement:	0,012% de valeur efficace* 0,025% de valeur efficace (JIS C5521) ±0,035% de crête (IEC 98A Pondéré)

* Mesuré par l'obtention d'un signal provenant du générateur de fréquences incorporé de l'ensemble du moteur.

Ronflement:	−56 dB (IEC 98A Non pondéré) −78 dB (IEC 98A Pondéré)

■ Bras de lecture

Type:	Bras de lecture d'alignement linéaire de type à équilibre dynamique avec suspension à la cardan à 4 pivots
Longueur effective:	105 mm
Angle d'erreur de piste:	En deçà de ±0,1°
Masse réelle:	9 g (y compris la cellule pick-up)
Fréquence de résonance:	12 Hz
Moteur d'entraînement du bras de lecture:	Moteur C.C.

■ Cellule pick-up

Type:	Cellule pick-up stéréo à aimant mobile
Circuit magnétique:	Noyau entièrement feuilleté
Réponse en fréquence:	10 Hz à 30 kHz 20 Hz à 10 kHz ±1 dB
Tension de sortie:	2,5 mV à 1 kHz; 5 cm/s. zéro à vitesse latérale de crête (7 mV à 1 kHz; 10 cm/s., zéro à vitesse 45° de crête [DIN 45 000])
Séparation des canaux:	22 dB à 1 kHz
Equilibrage des canaux:	En deçà de 2 dB à 1 kHz
Impédance de charge recommandée:	47 kΩ~100 kΩ
Elasticité (dynamique):	12 × 10^{6} cm/dyne à 100 Hz
Plage de la force verticale d'appui:	1,25 ±0,25 g (12,5 ±2,5 mN)
Poids:	6 g (cellule seule)
Remplacement de la pointe de lecture:	EPS-24CS

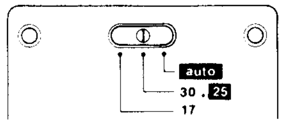
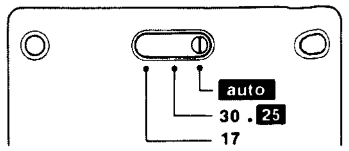
■ REGLAGES

- **Equipement utilisé et conditions de service de l'appareil**

1. Oscilloscope
2. Voltmètre à C.C.
3. Disque de 30 cm
4. Tournevis
5. Tourne-à-gauche Hexagonal (M3)

Etape	Article	Préparatifs	Partie	Marche à suivre
1	**Position de démarrage**	1. Installer un disque de 30 cm et refermer le boîtier frontal. 2. Mettre en marche l'interrupteur d'alimentation. 3. Appuyer sur le commutateur de démarrage.	Vis de réglage du positionnement de démarrage. (Fig. 21)	1. Ouvrir le boîtier frontal. 2. Si la pointe de lecture s'abaisse entre les plages du disque, l'ajuster an tournant la vis dans le sens inverse des aiguilles d'une montre. 3. Si la pointe de lecture s'abaisse à l'extérieur du disque, l'ajuster en tournant la vis dans le sens des aiguilles d'une montre.
2	**Angle de décalage du bras de lecture**	1. Ouvrir le boîtier frontal. 2. Mettre en marche l'interrupteur d'alimentation. 3. Appuyer sur le commutateur de démarrage pour faire déplacer le bras de lecture vers l'intérieur, puis mettre hors circuit l'interrupteur d'alimentation.	Vis de réglage de l'angle de décalage. (Fig. 23)	1. Tourner la vis de réglage de l'angle de décalage de telle sorte que le centre du bras de lecture coincide avec la cannelure de la tige d'élévation.
3	**Amplification servo-mécanique**	1. Brancher un voltmètre à la borne CN303 (+) et 2 (−) de la plaquette à circuits imprimés principale (Fig. 22) 2. Mettre en marche l'interrupteur d'alimentation.	VR501 (Fig. 24)	1. Déplacer complètement le bras de lecture vers la droite. 2. Ajuster VR501 de telle sorte que la tension de sortie soit de 3,6V.
4	**Tension de décalage**	1. Brancher un voltmètre à C.C. à la borne CN303 "3" (+) et (−) de la plaquette à circuits imprimés principale. (Fig. 22) 2. Mattre en marche l'interrupteur d'alimentation.	Vis de réglage de la tension de décalage. (Fig. 24)	1. Déplacer le bras de lecture vers la centre. 2. Tourner la vis de réglage de telle sorte que la tension de sortie soit de 1,8V. (Utiliser le tourne-à-gauche hexagonal.)
5	**Fréquence des impulsions de rythme**	1. Connecter l'émetteur Q1 et la broche IC301 ⑭. (Fig. 22) 2. Brancher un oscilloscope à la broche IC301 ⑬.	VR301 (Fig. 22)	1. Mettre en marche l'interrupteur d'alimentation. 2. Ajuster VR301 de telle sorte que la cycle de la forme d'onde de sortie soit de 30μs ± 1μs.
6	**Vitesse de rotation**	1. Ouvrir le boîtier frontal et placer un disque. 2. Installer le stroboscope. 3. Refermer le boîtier frontal.	VR201 (45 t/p.m.) VR202 (33 t/p.m.)	1. Mettre en marche l'interrupteur d'alimentation. 2. Régler le commutateur sélecteur de vitesse sur "45". 3. Ajuster VR201 de telle sorte que la vitesse atteigne la valeur nominale de 45 t/p.m. 4. Régler le commutateur sélecteur de vitesse sur "33". 5. Ajuster VR202 de telle sorte que la vitesse atteigne la valeur nominale de 33-1/3 t/p.m. **Nota:** S'assurer de régler tout d'abord la vitesse sur 45 t/p.m.

■ Le tourne-disque risque de ne pas se comporter comme on l'escomptait lorsque l'on fait jouer les sortes de disques suivants. Cela ne signifie nullement un fonctionnement défectueux de l'appareil. En pareils cas, suivre les directives ci-dessous.

Disque		Fonctionnement	Observations
■ **Disques de 25 cm.** 		1. Régler le sélecteur du diamètre d'un disque sur la position de "30. **25** ". 2. **Maintenir enfoncée la touche de mise en marche de façon à ce que le bras de lecture se déplace à une position au-dessus des sillons désirés du disque.** 3. Appuyer sur la commande de pose/relevage.	• Généralement, le sélecteur du diamètre d'un disque devra être laissé sur la position "auto". 
■ Disques qui sont transparents, colorés ou d'un noir translucide—n'importe quel disque qui ne coupe pas entièrement la lumière.	Disques de 30 cm	1. Régler le sélecteur du diamètre d'un disque sur la position de "30. **25** ". 2. Utiliser sur le mode d'audition ou de lecture de recherche automatique.	• **Une audition répétée n'est pas possible pour les disques de 25 cm ou les disques qui ne satisfont pas aux dimensions des normes industrielles du fait que le diamètre n'est pas automatiquement détecté.** • **Régler le sélecteur de vitesse sur 33 ou 45 selon la vitesse appropriée pour le disque en question.** • **Dans certains cas, il n'est pas possible de faire jouer des disques s'ils ne répondent pas aux dimensions des normes industrieles.**
	Disques de 17 cm	1. Régler le sélecteur du diamètre d'un disque sur la position de "17". 2. Utiliser sur le mode d'audition ou de lecture de recherche automatique.	

ESPAÑOL

■ ESPECIFICACIONES

Las especificaciones quedan sujetas a cambios sin aviso previo.
El peso y las dimensiones indicados son apromimados.

■ En general

Alimentación de corriente:	~110V—120/220—240V, 50/60 Hz
Consumo de corriente:	13 W
Dimensiones: (Ancho×Alto×Prof.)	31,5 × 37,2 × 18,5 cm
Peso:	6,2 kg

■ Sección del plato giratorio

Tipo:	Plato giratorio automático Arranque automático/ Descenso automático Retorno automático Parada automática Ejecución repetida Selección automática de la velocidad Es posible seleccionar la velocidad a mano Selección automática del tamaño Detección de presencia de disco
Método de accionamiento:	Accionamiento directo
Motor:	Motor de corriente continua sin escobillas
Platillo del plato giratorio:	Aluminio fundido 30 cm de diámetro
Velocidades del plato giratorio:	33-1/3 y 45 rpm
Ululaciones y trémolo:	0,012% WRMS* 0,025% WRMS (JIS C5521) ±0,035% cresta (IEC 98A Ponderado)

* Medido obteniendo una señal proveniente del generador de frecuencias incorporado del conjunto del motor.

Ruido de rodadura:	−56 dB (IEC 98A No ponderado) −78 dB (IEC 98A Ponderado)

■ Sección del brazo sonoro

Tipo:	Brazo sonoro de seguimiento lineal de tipo con equilibrio dinámico con suspensión cardánica de 4 pivotes
Longitud efectiva:	10,5 cm
Angulo de error de seguimiento:	Inferior a 0,1° aproxim.
Masa efectiva:	9 g (incluyendo el cartucho)
Frecuencia de resonancia:	12 Hz
Motor de accionamiento del brazo sonoro:	Motor de corriente continua

■ Sección del cartucho

Tipo:	Cartucho estereofónico de imán móvil
Circuito magnético:	Núcleo totalmente laminado
Respuesta de frecuencia:	10 Hz a 30 kHz 20 Hz a 10 kHz ±1 dB
Voltaje de salida:	2,5 mV a 1 kHz Velocidad lateral de cero a cresta de 5 cm/s (7 mV a 1 kHz. Velocidad de 45° de cero a cresta de 10 cm/s [DIN 45 000])
Separación de canales:	22 dB a 1 kHz
Equilibrio de canales:	Inferior a 2 dB a 1 kHz
Impedancia de carga recomendada:	47 kΩ a 100 kΩ
Elasticidad (dinámica):	12×10^{-6} cm/dina a 100 Hz
Radio de presión de la aguja:	1,25 ±0,25 g (12,5 ±2,5 mN)
Peso:	6 g (cartucho solamente)
Aguja de recambio:	EPS-24CS

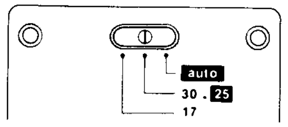
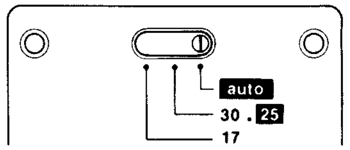
■ AJUSTES

- **Equipos usados y estado del aparato**

1. Osciloscopio
2. Voltímetro CC
3. Disco de 30 cm
4. Destornilladores
5. Llave de varilla hex. (M3)

Paso	Item	Preparaciones	Porción	Procedimiento
1	**Posición de arranque**	1. Poner un disco de 30 cm y cerrar el gabinete frontal. 2. Conectar el interruptor de alimentación. 3. Apretar el botón de arranque.	Tornillo de ajuste de posición de arranque (Fig. 21)	1. Abrir el gabinete frontal. 2. Si la aguja cae entre tonadas, ajustarla girando el tornillo a la izquierda. 3. Si la aguja cae fuera del disco, ajustarla girando el tornillo a la derecha.
2	**Angulo de fricción de brazo de fonocaptor**	1. Abrir el gabinete frontal. 2. Conectar el interruptor de alimentación. 3. Apretar el interruptor de arranque para mover el brazo del fonocaptor hacia dentro y, luego, desconectar el interruptor de alimentación.	Tornillo de ajuste de ángulo de fricción (Fig. 23)	1. Girar el tornillo de ajuste de ángulo de fricción de manera que el centro del brazo de fonocaptor corresponda con la ranura-V de varilla de alza.
3	**Servoganancia**	1. Conectar el voltímetro a terminal CN303 (+) y 2 (−) de T.C.I. (P.C.B.) principal. (Fig. 22) 2. Conectar el interruptor de alimentación.	VR501 (Fig. 24)	1. Mover completamente el brazo de fonocaptor a la derecha. 2. Ajustar el VR501 de manera que el voltaje de salida sea 3,6V.
4	**Voltaje contrapuesta**	1. Conectar el voltímetro CC a terminal CN303 "3" (+) y (−) de T.C.I. principal. (Fig. 22) 2. Conectar el interruptor de alimentación.	Tornillo de ajuste de voltaje contrapuesta (Fig. 24)	1. Mover el brazo de fonocaptor al centro. 2. Girar el tornillo de ajuste de manera que el voltaje de salida sea 1,8V. (Usar llave de varilla hex.)
5	**Frecuencia de reloj**	1. Conectar emisor Q1 y patilla de IC301 ⑭. (Fig. 22) 2. Conectar el osciloscopio a patilla de IC301 ⑬.	VR301 (Fig. 22)	1. Conectar el interruptor de alimentación. 2. Ajustar VR301 de manera que el ciclo de forma de onda de salida sea 30μs ± 1μs.
6	**Velocidad giratoria**	1. Abrir el gabinete frontal y colocar el disco. 2. Colocar el estroboscopio. 3. Cerrar el gabinete frontal.	VR201 (45 r.p.m.) VR202 (33 r.p.m.)	1. Conectar el interruptor de alimentación. 2. Poner el interruptor selector de velocidad en "45". 3. Ajustar VR201 de manera que la velocidad esté en el régimen (45 r.p.m.) 4. Poner el interruptor selector de velocidad en "33". 5. Ajustar VR202 de manera que la velocidad esté en el régimen (33-1/3 r.p.m.) **Nota:** Asegurarse de ajustar la velocidad 45 r.p.m. primero.

■ **Puede ocurrir que el plato giratorio no funcione como sería de esperar cuando se toquen los siguientes tipos de discos. Esto no quiere, empero, decir que haya algún desperfecto en el plato giratorio. En tales casos, convendrá atenerse a las instrucciones siguientes.**

Disco		Funcionamieuto	Observaciones
■ **Discos de 25 cm** 		1. Colocar el selector de tamaño de discos en la posición de "30. 25 ". 2. **Mantener apretado el interruptor de arranque de manera que el brazo sonoro se mueva hasta encima de la posición correspondiente de los surcos de comienzo del disco que se piensa tocar.** 3. Apretar el control de colocación.	• Ordinariamente, el selector de tamaño de discos habrá que dejarlo en la posición "auto". 
■ **Discos transparentes de color o negros translúcidos o sea, todos aquellos discos que no impidan el paso a la luz en forma absoluta.**	Discos de 30 cm	1. Colocar el selector de tamaño de discos en la posición de "30. 25 ". 2. Usarlos en la modalidad de ejecución automática o con la de búsqueda.	• **No es posible hacer una ejecución repetida con los discos de 25 cm ni con aquéllos que no se conformen a las dimensiones corrientes de la industria del ramo debido a que el tamaño de los mismos no logra ser detectado en forma automática.** • **Colocar el selector de velocidad en 33 o en 45 según la velocidad que corresponda al disco en cuestión.** • **En algunos casos no será posible tocar discos que no se conformen a las dimensiones corrientes en la industria del ramo.**
	Discos de 17 cm	1. Colocar el selector de tamaño de discos en la posición de "17". 2. Usarlos en la modalidad de ejecución automática o con la de búsqueda.	

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ORDER NO. HAD85032443P8

Parts Change Notice

Model No. SL-V5

Service Manual
Order No. SD83022410C8

Please revise the original parts list in the Service Manual to conform to the change (s) shown herein. If new part numbers are shown, be sure to use them when orderring parts.

Reason for Change *The circled item indicates the reason. If no marking, see the Notes in the bottom column.

1. Improve performance
2. Change of material or dimension
3. To meet approved specification
4. Standardization
5. Addition
6. Deletion
7. Correction
8. Other

Interchangeability Code **The circled item Indicates the interchangeability. If no marking, see the Notes in the bottom column.

	Parts	Set Production	
A	Original New	Early Late	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original New	Early Late	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts where possible, then stock new parts.
C	Original New	Early Late	New parts only may be used in early or late production sets. Stock new parts.
D	Original New	Early Late	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Other		

Part Number

Model No.	Ref. No.	Original Part No.	New Part No.	Notes (*'**)	Part Name & Descriptions	
SL-V5	N11	SFXGV05N01	XSN3+30S	7, C	Screw	
	N12	SFXWC10–03	SFXGV05N01	7, C	Screw	

File this Parts Change Notice with your copy of the Service Manual.

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Printed in Japan
85030088 ◐ Ⓚ KK

ORDER NO. SD83022410C8

Service Manual

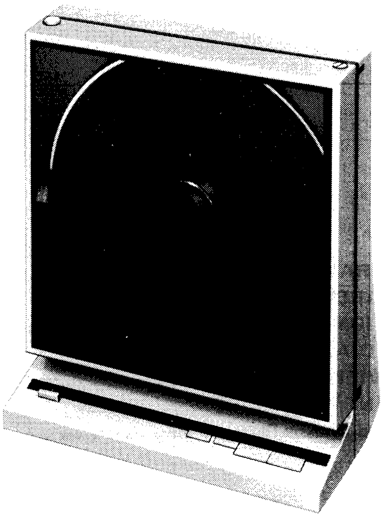
Direct Drive Automatic Turntable System

SL-V5

[E], [EK], [XL], [EG], [EB],
[EH], [EF], [Ei], [EC], [XA], [XM]

SL-V5 (K)

[E], [EK], [XL], [EG], [EB],
[EH], [EF], [Ei], [EC], [XA], [XM]



Areas

- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [XL] is available in Australia.
- * [EG] is available in F.R. Germany.
- * [EB] is available in Belgium.
- * [EH] is available in Holland.
- * [EF] is available in France.
- * [Ei] is available in Italy.
- * [EC] is available in Czechoslovakia.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XM] is available in Central South America.

T4P is the standard mark for the "P-mount" plug-in-connector system. Products carrying this mark are inter-changeable and compatible with each other.

***The cabinet and dust cover are available in black color and silver types.**
***The black type model is provided with (K) in the Service Manual.**

English

Specifications

Specifications subject to change without notice.
Weight and dimensions shown are approximate.

■ General

Power supply:	~220V, 50/60 Hz (for Continental Europe)
Power consumption:	13 W
Dimensions: (W x H x D)	31.5 x 37.2 x 18.5 cm (12-1/2" x 14-41/64" x 7-9/32")
Weight:	6.2 kg (13.7 lb.)

■ Turntable section

Type:	Automatic turntable Auto start/Auto lead-in Auto return Auto stop Repeat play Auto speed select Manual speed selection possible Auto size select Record presence detection
Drive method:	Direct drive
Motor:	Brushless DC motor
Turntable platter:	Aluminum die-cast Diameter 30 cm (12")
Turntable speeds:	33-1/3 r.p.m and 45 r.p.m.
Wow and filter:	0.012% WRMS* 0.025% WRMS (JIS C5521) ± 0.035% peak (IEC 98A Weighted)

* Measured by obtaining signal from built-in frequency generator of motor assembly.

Rumble:	−56 dB (IEC 98A Unweighted) −78 dB (IEC 98A Weighted)

■ Tonearm section

Type:	Dynamic balanced type Linear tracking tonearm 4-pivot gimbal suspension
Effective length:	10.5 cm (4-1/8")
Tracking error angle:	Within ± 0.1°
Effective mass:	9 g (including cartridge)
Resonance frequency:	12 Hz
Tonearm drive motor:	DC motor
Phono cable ccapacitance:	150 pF

■ Cartridge section

Type:	Moving magnet stereo cartridge
Magnet circuit:	All laminated core
Frequency response:	10 Hz ~ 30 kHz 20 Hz ~ 10 kHz ± 1 dB
Output voltage:	2.5 mV at 1 kHz, 5 cm/s. zero to peak lateral velocity (7 mV at 1 kHz, 10 cm/s. zero to peak 45° velocity [DIN 45 500])
Channel separation:	22 dB at 1 kHz
Channel balance:	Within 2 dB at 1 kHz
Recommended load impedance:	47 kΩ ~ 100 kΩ
Compliance (dynamic):	12 x 10^{-6} cm/dyne at 100 Hz
Stylus pressure range:	1.25 ± 0.25 g (12.5 ± 2.5 mN)
Weight:	6 g (cartridge only)
Replacement stylus:	EPS-24CS

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

- The power supply for this unit varies depending upon the areas. Also, the parts used for power supply are different. So, refer to the circuit diagram and the replacement parts list.
  - * 220V (50/60 Hz) for Continental Europe.
  - * 240V (50/60 Hz) for United Kingdom and Australia.
  - * 110V/120V/220V/240V (50/60 Hz) for other areas.
  - – [XA and XM areas] for other areas is provided with voltage selector.

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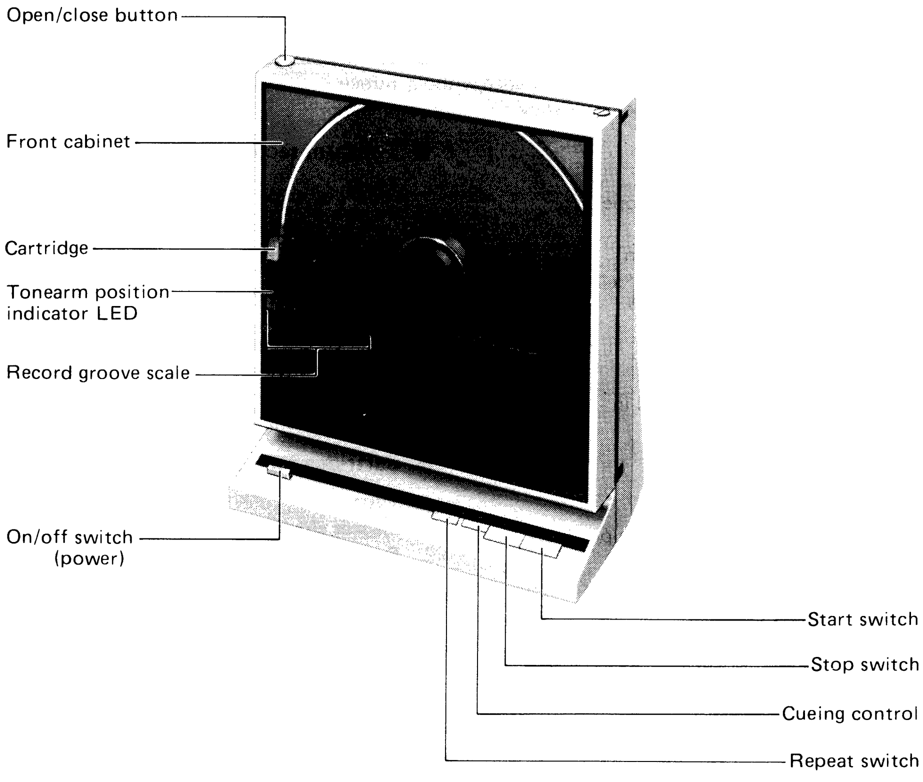
■ LOCATION OF CONTROLS


Open/close button
Front cabinet
Cartridge
Tonearm position indicator LED
Record groove scale
On/off switch (power)
Start switch
Stop switch
Cueing control
Repeat switch

ORDER NO. SD83022410C8-A

Direct Drive Automatic Turntable System

SL-V5

This booklet contains the specifications and adjusting procedures for SL-V5, written in Germany, French and Spanish. File this manual together with the SL-V5 service manual (Order No. SD83022410C8).

DEUTSCH

■ TECHNISCHE DATEN

Änderungen der technischen Daten vorbehalten.
Die angegebenen Gewichts- und Abmessungsdaten sind ungefähre Werte.

■ Allgemeine Daten

Stromversorgung:	~220 V 50 Hz Wechselstrom
Leistungsaufnahme:	13 W
Abmessungen: (B×H×T)	31,5 × 37,2 × 18,5 cm
Gewicht:	6,2 kg

■ Plattenspieler

Typ:	Auto-Start/Auto-Zuführung Rückführautomatik Stopp-Automatik Wiederhol-Betrieb Automatische Drehzahlwahl Manuelle Drehzahlwahl möglich Automatische Plattengrößewahl Plattenpräsenz-Registrierung
Antrieb:	Direktantrieb
Motor:	Kollektorloser Gleichstrommotor
Plattenteller:	Aluminium-Druckguß Durchmesser 30 cm
Plattenteller-Drehzahlen:	33-1/3 und 45 U/min
Gleichlaufschwankungen:	0,012% WRMS* 0,025% WRMS (JIS C5521) ±0,035% Spitze (IEC 98A bewertet)

* Gemessen anhand von Signalen vom eingebauten Frequenzgenerator des Motorbauteils.

Rumpel-Fremdspannungsabstand:	−56 dB (IEC 98A unbewertet)
Rumpel-Geräuschspannungsabstand:	−78 dB (IEC 98A bewertet)

■ Tonarm

Typ:	Dynamisch ausbalancierter Tangential-Tonarm mit Kardanaufhängung mit 4-Punkt-Drehlager
Effektive Länge:	10,5 cm
Spurfehlwinkel:	Innerhalb ±0,1°
Effektive Masse:	9 g (einschließlich Tonabnehmer)
Resonanzfrequenz:	12 Hz
Tonarm-Antriebsmotor:	Gleichstrommotor

■ Tonabnehmer

Typ:	Stereo-Magnet-Tonabnehmer
Magnetkreis:	Ganzlamellenkern
Frequenzgang:	10 Hz bis 30 kHz 20 Hz bis 10 kHz ±1 dB
Ausgangsspannung:	2,5 mV bei 1 kHz 5 cm/s. Null-zu-Spitze, lateral [7 mV bei 1 kHz 10 cm/s. Null-zu-Spitze, 45° (DIN 45 000)]
Kanaltrennung:	22 dB bei 1 kHz
Kanalabweichung:	Innerhalb 2 dB bei 1 kHz
Empfohlene Endimpedanz:	47 kΩ ~ 100 kΩ
Nachgiebigkeit (dynamisch):	12×10^{-6} cm/dyn bei 100 Hz
Auflagekraft-Einstellbereich:	1,25 ±0,25 g (12,5 ±2,5 mN)
Gewicht:	6 g (nur Tonabnehmer)
Ersatznadel:	EPS-24CS

■ JUSTIERUNGEN

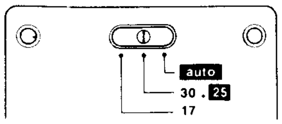
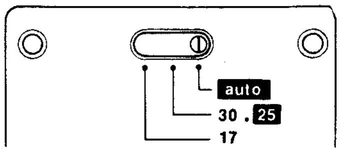
- **Verwendete Geräte und Zustand des Gerätes**

1. Oszilloskop
2. Gleichstrom-Voltmeter
3. 30 cm-Schallplatte
4. Schraubenzieher
5. Sechskant-Gestängeschlüssel (M3)

Schritt	Posten	Vorbereitungen	Zu justierende Teile	Vorgehen
1	Start-Position	1. Eine 30 cm-Platte auflegen und das Vorderteil des Gehäuses schließen. 2. Den Netzschalter einschalten. 3. Den Start-Schalter drücken.	Startpositions-Justierungsschraube (Abb. 21)	1. Vorderteil des Gehäuses öffnen. 2. Falls die Abtastnadel zwischen Musikstücken aufsetzt, durch Drehen der Schraube entgegen dem Uhrzeigersinn justieren. 3. Falls die Abtastnadel außerhalb der Platte aufsetzt, durch Drehen der Schraube im Uhrzeigersinn justieren.

Schritt	Posten	Vorbereitungen	Zu justierende Teile	Vorgehen
2	**Tonarmwinkel**	1. Das Vorderteil des Gehäuses öffnen. 2. Den Netzschalter einschalten. 3. Den Start-Schalter drücken, um den Tonarm nach innen zu bewegen, und dann den Netzschalter ausschalten.	Tonarmwinkel-Justierschraube (Abb. 23)	1. Die Tonarmwinkel-Justierschraube so drehen, daß die Tonarmmitte mit der V-Kerbe der Liftstange übereinstimmt.
3	**Servo-Verstärkung**	1. Das Voltmeter an den CN-Anschluß CN303 (+) und②(–) der Hauptleiterplatte anschließen. (Abb. 22) 2. Den Netzschalter einschalten.	VR501 (Abb. 24)	1. Den Tonarm vollständig nach rechts bewegen. 2. VR501 so justieren, daß die Ausgangsspannung 3,6V beträgt.
4	**Offset-Spannung**	1. Gleichstrom-Voltmeter an CN303, Anschluß③(+) und (–) der Hauptleiterplatte anschließen. (Abb. 22) 2. Den Netzschalter einschalten.	Offsetspannungs-Justierschraube (Abb. 24)	1. Den Tonarm zur Mitte bewegen. 2. Die Justierschraube so drehen, daß die Ausgangsspannung 1,8V beträgt. (Sechskant-Gestängeschlüssel verwenden.)
5	**Taktgeber-Frequenz**	1. Q1 Emitter mit IC301, Stift ⑭ verbinden. (Abb. 22) 2. Oszilloskop IC301, Stift ⑬ verbinden.	VR301 (Abb. 22)	1. Den Netzschalter einschalten. 2. VR301 justieren, so daß der Ausgangswellenform-Zyklus 30 μs ± 1 μs beträgt.
6	**Drehzahl**	1. Vorderteil des Gehäuses öffnen und die Platte auflegen. 2. Das Stroboskop einschalten. 3. Vorderteil des Gehäuses schließen.	VR201 (45 U/min.) VR202 (33 U/min.)	1. Den Netzschalter einschalten. 2. Den Drehzahl-Wahlschalter auf "45" einstellen. 3. VR201 so justieren, daß die Drehzahl dem Sollwert (45 U/min.) entspricht. 4. Den Drehzahl-Wahlschalter auf "33" einstellen. 5. VR202 so justieren, daß die Drehzahl dem Sollwert (33 1/3 U/min.) entspricht. **Anmerkung:** Unbedingt zuerst die Justierung für 45 U/min. vornehmen.

■ **Beim Abspielen nachstehender Plattentypen ist es möglich, daß der Plattenspieler nicht normal funktioniert. Dies stellt jedoch dein fehlerhaftes Funktionieren des Plattenspielers dar. Folgen Sie in solchen Fällen den nachstehenden Hinweisen.**

Schallplatte		Bedienung	Anmerkungen
■ **25 cm-Platten.** 		1. Stellen Sie den Schallplattengrößenwähler in die "30. 25 " Position. 2. **Halten Sie den Start-Start-Schalter gedrückt, damit sich der Tonarm bis zu einem Punkt über der Einlaufrille der Platte bewegt.** 3. Drücken Sie die Liftsteuerung.	• Normalerweise sollte der Schallplattengrößenwähler in der "auto"–Stellung gelassen werden.  • **Wiederholtes Abspielen ist nicht möglich für 25 cm-Platten oder solche Platten, die nicht den Industrienormen entsprechen, da die Größe nicht automatisch erfaßt wird.** • **Stellen Sie den Drehzahl-Wahlschalter auf 33 oder 45 ein, entsprechend der erforderlichen Drehzahl für die abzuspielende Platte.** • **In gewissen Fällen könnte es unmöglich sein, Platten abzuspielen, deren Abmessungen nicht den Industrienormen entsprechen.**
■ **Platten, die transparent, farbig oder durchsichtig schwarz sind- d.h. alle Platten, die Licht nicht vollständig blockieren.**	30 cm-Platten	1. Stellen Sie den Schallplattengrößenwähler in die "30. 25 " Position. 2. Mit automatischer oder Suchspiel-Betriebsart verwenden.	
	17 cm-Platten	1. Stellen Sie den Schallplattengrößenwähler in die "17" Position. 2. Mit automatischer oder Suchspiel-Betriebsart verwenden.	

FRANÇAIS

■ CARACTERISTIQUES

Les spécifications sont susceptibles d'être modifiées sans préavis.
Le poids et les dimensions donnés sont approximatifs.

■ Généralités

Alimentation:	~220 V 50 Hz
Consommation:	13 W
Dimensions: (L×H×P)	31,5 × 37,2 × 18,5 cm
Poids:	6,2 kg

■ Platine de lecture

Type:	Platine automatique Départ automatique/Entrée automatique Retour automatique Arrêt automatique Auditon répétée Sélection de vitesse automatique Sélection automatique du diamètre Sélection de vitesse manuelle possible Détection de la présence d'un disque
Système d'entraînement:	Entraînement direct
Moteur:	Moteur C.C. sans balai
Plateau de lecture:	Aluminium moulé sous pression Diamètre 30 cm
Vitesses de la platine:	33-1/3 et 45 t/p.m.
Pleurage et scintillement:	0,012% de valeur efficace* 0,025% de valeur efficace (JIS C5521) ±0,035% de crête (IEC 98A Pondéré)

* Mesuré par l'obtention d'un signal provenant du générateur de fréquences incorporé de l'ensemble du moteur.

Ronflement:	−56 dB (IEC 98A Non pondéré) −78 dB (IEC 98A Pondéré)

■ Bras de lecture

Type:	Bras de lecture d'alignement linéaire de type à équilibre dynamique avec suspension à la cardan à 4 pivots
Longueur effective:	105 mm
Angle d'erreur de piste:	En deçà de ±0,1°
Masse réelle:	9 g (y compris la cellule pick-up)
Fréquence de résonance:	12 Hz
Moteur d'entraînement du bras de lecture:	Moteur C.C.

■ Cellule pick-up

Type:	Cellule pick-up stéréo à aimant mobile
Circuit magnétique:	Noyau entièrement feuilleté
Réponse en fréquence:	10 Hz à 30 kHz 20 Hz à 10 kHz ±1 dB
Tension de sortie:	2,5 mV à 1 kHz; 5 cm/s. zéro à vitesse latérale de crête (7 mV à 1 kHz; 10 cm/s., zéro à vitesse 45° de crête [DIN 45 000])
Séparation des canaux:	22 dB à 1 kHz
Equilibrage des canaux:	En deçà de 2 dB à 1 kHz
Impédance de charge recommandée:	47 kΩ~100 kΩ
Elasticité (dynamique):	12 × 10 ° cm/dyne à 100 Hz
Plage de la force verticale d'appui:	1,25 ±0,25 g (12,5 ±2,5 mN)
Poids:	6 g (cellule seule)
Remplacement de la pointe de lecture:	EPS-24CS

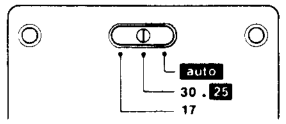
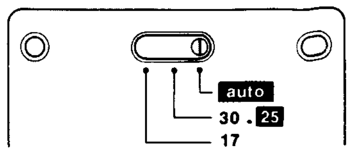
■ REGLAGES

- **Equipement utilisé et conditions de service de l'appareil**

1. Oscilloscope
2. Voltmètre à C.C.
3. Disque de 30 cm
4. Tournevis
5. Tourne-à-gauche Hexagonal (M3)

Etape	Article	Préparatifs	Partie	Marche à suivre
1	**Position de démarrage**	1. Installer un disque de 30 cm et refermer le boîtier frontal. 2. Mettre en marche l'interrupteur d'alimentation. 3. Appuyer sur le commutateur de démarrage.	Vis de réglage du positionnement de démarrage. (Fig. 21)	1. Ouvrir le boîtier frontal. 2. Si la pointe de lecture s'abaisse entre les plages du disque, l'ajuster an tournant la vis dans le sens inverse des aiguilles d'une montre. 3. Si la pointe de lecture s'abaisse à l'extérieur du disque, l'ajuster en tournant la vis dans le sens des aiguilles d'une montre.
2	**Angle de décalage du bras de lecture**	1. Ouvrir le boîtier frontal. 2. Mettre en marche l'interrupteur d'alimentation. 3. Appuyer sur le commutateur de démarrage pour faire déplacer le bras de lecture vers l'intérieur, puis mettre hors circuit l'interrupteur d'alimentation.	Vis de réglage de l'angle de décalage. (Fig. 23)	1. Tourner la vis de réglage de l'angle de décalage de telle sorte que le centre du bras de lecture coincide avec la cannelure de la tige d'élévation.
3	**Amplification servo-mécanique**	1. Brancher un voltmètre à la borne CN303 (+) et 2 (–) de la plaquette à circuits imprimés principale (Fig. 22) 2. Mettre en marche l'interrupteur d'alimentation.	VR501 (Fig. 24)	1. Déplacer complètement le bras de lecture vers la droite. 2. Ajuster VR501 de telle sorte que la tension de sortie soit de 3,6V.
4	**Tension de décalage**	1. Brancher un voltmètre à C.C. à la borne CN303 "3" (+) et (–) de la plaquette à circuits imprimés principale. (Fig. 22) 2. Mattre en marche l'interrupteur d'alimentation.	Vis de réglage de la tension de décalage. (Fig. 24)	1. Déplacer le bras de lecture vers la centre. 2. Tourner la vis de réglage de telle sorte que la tension de sortie soit de 1,8V. (Utiliser le tourne-à-gauche hexagonal.)
5	**Fréquence des impulsions de rythme**	1. Connecter l'émetteur Q1 et la broche IC301 ⑭. (Fig. 22) 2. Brancher un oscilloscope à la broche IC301 ⑬.	VR301 (Fig. 22)	1. Mettre en marche l'interrupteur d'alimentation. 2. Ajuster VR301 de telle sorte que la cycle de la forme d'onde de sortie soit de 30µs ± 1µs.
6	**Vitesse de rotation**	1. Ouvrir le boîtier frontal et placer un disque. 2. Installer le stroboscope. 3. Refermer le boîtier frontal.	VR201 (45 t/p.m.) VR202 (33 t/p.m.)	1. Mettre en marche l'interrupteur d'alimentation. 2. Régler le commutateur sélecteur de vitesse sur "45". 3. Ajuster VR201 de telle sorte que la vitesse atteigne la valeur nominale de 45 t/p.m. 4. Régler le commutateur sélecteur de vitesse sur "33". 5. Ajuster VR202 de telle sorte que la vitesse atteigne la valeur nominale de 33-1/3 t/p.m. **Nota:** S'assurer de régler tout d'abord la vitesse sur 45 t/p.m.

■ Le tourne-disque risque de ne pas se comporter comme on l'escomptait lorsque l'on fait jouer les sortes de disques suivants. Cela ne signifie nullement un fonctionnement défectueux de l'appareil. En pareils cas, suivre les directives ci-dessous.

Disque		Fonctionnement	Observations
■ **Disques de 25 cm.** 		1. Régler le sélecteur du diamètre d'un disque sur la position de "30. 25 ". 2. **Maintenir enfoncée la touche de mise en marche de façon à ce que le bras de lecture se déplace à une position au-dessus des sillons désirés du disque.** 3. Appuyer sur la commande de pose/relevage.	• Généralement, le sélecteur du diamètre d'un disque devra être laissé sur la position "auto". 
■ Disques qui sont transparents, colorés ou d'un noir translucide—n'importe quel disque qui ne coupe pas entièrement la lumière.	Disques de 30 cm	1. Régler le sélecteur du diamètre d'un disque sur la position de "30. 25 ". 2. Utiliser sur le mode d'audition ou de lecture de recherche automatique.	• **Une audition répétée n'est pas possible pour les disques de 25 cm ou les disques qui ne satisfont pas aux dimensions des normes industrielles du fait que le diamètre n'est pas automatiquement détecté.** • **Régler le sélecteur de vitesse sur 33 ou 45 selon la vitesse appropriée pour le disque en question.** • **Dans certains cas, il n'est pas possible de faire jouer des disques s'ils ne répondent pas aux dimensions des normes industrielles.**
	Disques de 17 cm	1. Régler le sélecteur du diamètre d'un disque sur la position de "17". 2. Utiliser sur le mode d'audition ou de lecture de recherche automatique.	

ESPAÑOL

■ ESPECIFICACIONES

Las especificaciones quedan sujetas a cambios sin aviso previo.
El peso y las dimensiones indicados son apromimados.

■ En general

Alimentación de corriente:	~110V–120/220–240V, 50/60 Hz
Consumo de corriente:	13 W
Dimensiones: (Ancho×Alto×Prof.)	31,5 × 37,2 × 18,5 cm
Peso:	6,2 kg

■ Sección del plato giratorio

Tipo:	Plato giratorio automático Arranque automático/ Descenso automático Retorno automático Parada automática Ejecución repetida Selección automática de la velocidad Es posible seleccionar la velocidad a mano Selección automática del tamaño Detección de presencia de disco
Método de accionamiento:	Accionamiento directo
Motor:	Motor de corriente continua sin escobillas
Platillo del plato giratorio:	Aluminio fundido 30 cm de diámetro
Velocidades del plato giratorio:	33-1/3 y 45 rpm
Ululaciones y trémolo:	0,012% WRMS* 0,025% WRMS (JIS C5521) ±0,035% cresta (IEC 98A Ponderado)

* Medido obteniendo una señal proveniente del generador de frecuencias incorporado del conjunto del motor.

Ruido de rodadura:	−56 dB (IEC 98A No ponderado) −78 dB (IEC 98A Ponderado)

■ Sección del brazo sonoro

Tipo:	Brazo sonoro de seguimiento lineal de tipo con equilibrio dinámico con suspensión cardánica de 4 pivotes
Longitud efectiva:	10,5 cm
Angulo de error de seguimiento:	Inferior a 0,1° aproxim.
Masa efectiva:	9 g (incluyendo el cartucho)
Frecuencia de resonancia:	12 Hz
Motor de accionamiento del brazo sonoro:	Motor de corriente continua

■ Sección del cartucho

Tipo:	Cartucho estereofónico de imán móvil
Circuito magnético:	Núcleo totalmente laminado
Respuesta de frecuencia:	10 Hz a 30 kHz 20 Hz a 10 kHz ±1 dB
Voltaje de salida:	2,5 mV a 1 kHz Velocidad lateral de cero a cresta de 5 cm/s (7 mV a 1 kHz. Velocidad de 45° de cero a cresta de 10 cm/s [DIN 45 000])
Separación de canales:	22 dB a 1 kHz
Equilibrio de canales:	Inferior a 2 dB a 1 kHz
Impedancia de carga recomendada:	47 kΩ a 100 kΩ
Elasticidad (dinámica):	12×10^{-6} cm/dina a 100 Hz
Radio de presión de la aguja:	1,25 ±0,25 g (12,5 ±2,5 mN)
Peso:	6 g (cartucho solamente)
Aguja de recambio:	EPS-24CS

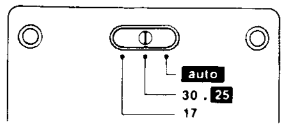
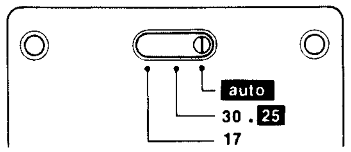
■ AJUSTES

- **Equipos usados y estado del aparato**

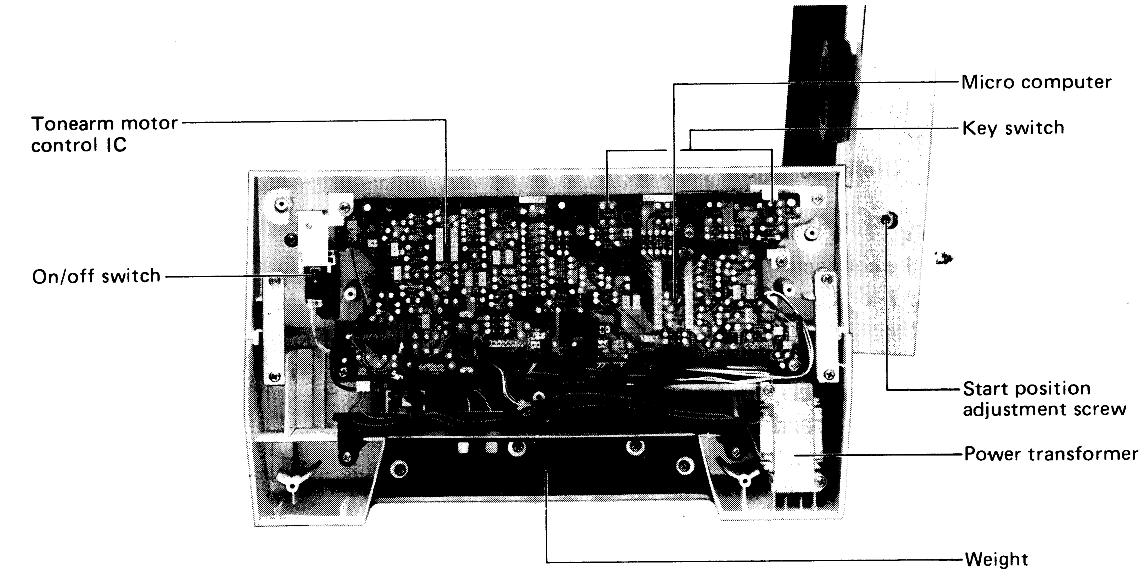
1. Osciloscopio
2. Voltímetro CC
3. Disco de 30 cm
4. Destornilladores
5. Llave de varilla hex. (M3)

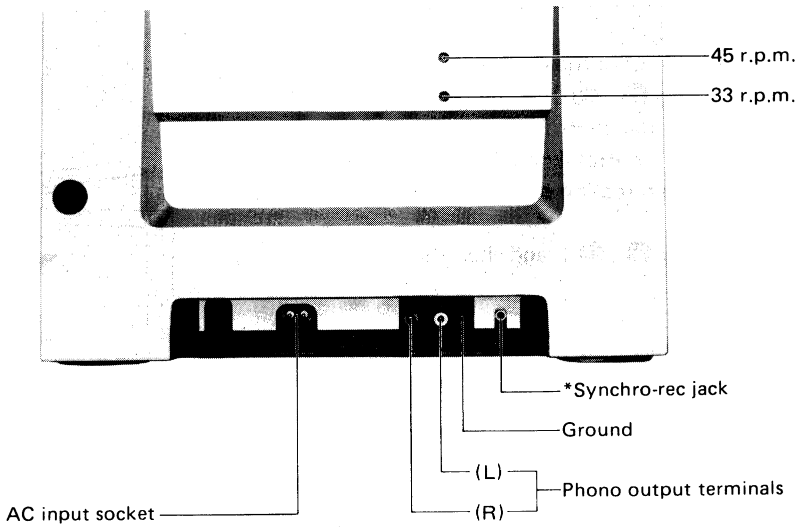
Paso	Item	Preparaciones	Porción	Procedimiento
1	**Posición de arranque**	1. Poner un disco de 30 cm y cerrar el gabinete frontal. 2. Conectar el interruptor de alimentación. 3. Apretar el botón de arranque.	Tornillo de ajuste de posición de arranque (Fig. 21)	1. Abrir el gabinete frontal. 2. Si la aguja cae entre tonadas, ajustarla girando el tornillo a la izquierda. 3. Si la aguja cae fuera del disco, ajustarla girando el tornillo a la derecha.
2	**Angulo de fricción de brazo de fonocaptor**	1. Abrir el gabinete frontal. 2. Conectar el interruptor de alimentación. 3. Apretar el interruptor de arranque para mover el brazo del fonocaptor hacia dentro y, luego, desconectar el interruptor de alimentación.	Tornillo de ajuste de ángulo de fricción (Fig. 23)	1. Girar el tornillo de ajuste de ángulo de fricción de manera que el centro del brazo de fonocaptor corresponda con la ranura-V de varilla de alza.
3	**Servoganancia**	1. Conectar el voltímetro a terminal CN303 (+) y 2 (−) de T.C.I. (P.C.B.) principal. (Fig. 22) 2. Conectar el interruptor de alimentación.	VR501 (Fig. 24)	1. Mover completamente el brazo de fonocaptor a la derecha. 2. Ajustar el VR501 de manera que el voltaje de salida sea 3,6V.
4	**Voltaje contrapuesta**	1. Conectar el voltímetro CC a terminal CN303 "3" (+) y (−) de T.C.I. principal. (Fig. 22) 2. Conectar el interruptor de alimentación.	Tornillo de ajuste de voltaje contrapuesta (Fig. 24)	1. Mover el brazo de fonocaptor al centro. 2. Girar el tornillo de ajuste de manera que el voltaje de salida sea 1,8V. (Usar llave de varilla hex.)
5	**Frecuencia de reloj**	1. Conectar emisor Q1 y patilla de IC301 ⑭. (Fig. 22) 2. Conectar el osciloscopio a patilla de IC301 ⑬.	VR301 (Fig. 22)	1. Conectar el interruptor de alimentación. 2. Ajustar VR301 de manera que el ciclo de forma de onda de salida sea 30μs ± 1μs.
6	**Velocidad giratoria**	1. Abrir el gabinete frontal y colocar el disco. 2. Colocar el estroboscopio. 3. Cerrar el gabinete frontal.	VR201 (45 r.p.m.) VR202 (33 r.p.m.)	1. Conectar el interruptor de alimentación. 2. Poner el interruptor selector de velocidad en "45". 3. Ajustar VR201 de manera que la velocidad esté en el régimen (45 r.p.m.) 4. Poner el interruptor selector de velocidad en "33". 5. Ajustar VR202 de manera que la velocidad esté en el régimen (33-1/3 r.p.m.) **Nota:** Asegurarse de ajustar la velocidad 45 r.p.m. primero.

- **Puede ocurrir que el plato giratorio no funcione como sería de esperar cuando se toquen los siguientes tipos de discos. Esto no quiere, empero, decir que haya algún desperfecto en el plato giratorio. En tales casos, convendrá atenerse a las instrucciones siguientes.**

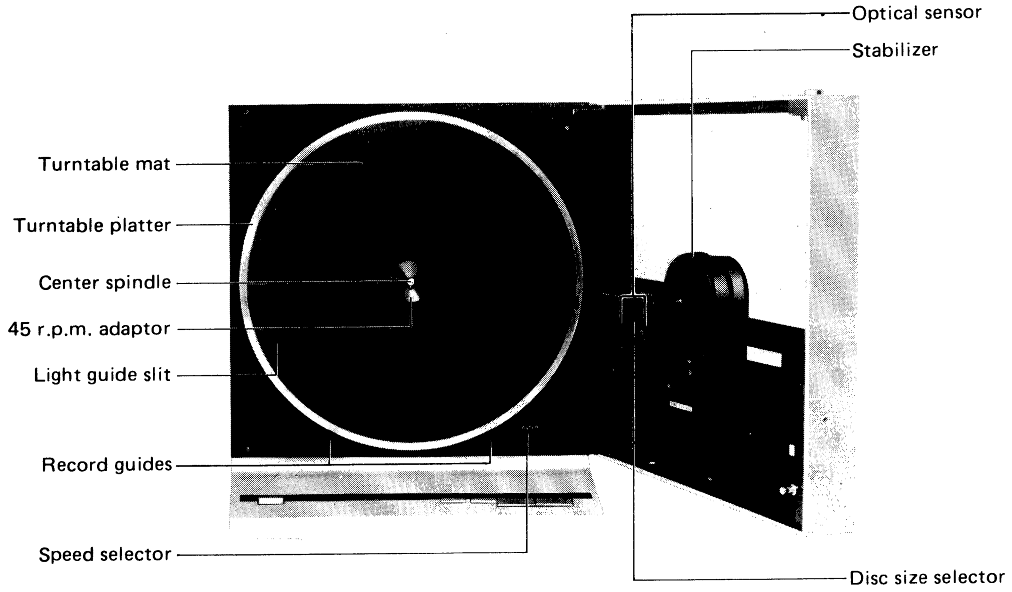
Disco		Funcionamieuto	Observaciones
■ **Discos de 25 cm** 		1. Colocar el selector de tamaño de discos en la posición de "30. 25 ". 2. **Mantener apretado el interruptor de arranque de manera que el brazo sonoro se mueva hasta encima de la posición correspondiente de los surcos de comienzo del disco que se piensa tocar.** 3. Apretar el control de colocación.	• Ordinariamente, el selector de tamaño de discos habrá que dejarlo en la posición "auto". 
■ **Discos transparentes de color o negros translúcidos o sea, todos aquellos discos que no impidan el paso a la luz en forma absoluta.**	Discos de 30 cm	1. Colocar el selector de tamaño de discos en la posición de "30. 25 ". 2. Usarlos en la modalidad de ejecución automática o con la de búsqueda.	• **No es posible hacer una ejecución repetida con los discos de 25 cm ni con aquéllos que no se conformen a las dimensiones corrientes de la industria del ramo debido a que el tamaño de los mismos no logra ser detectado en forma automática.** • **Colocar el selector de velocidad en 33 o en 45 según la velocidad que corresponda al disco en cuestión.** • **En algunos casos no será posible tocar discos que no se conformen a las dimensiones corrientes en la industria del ramo.**
	Discos de 17 cm	1. Colocar el selector de tamaño de discos en la posición de "17". 2. Usarlos en la modalidad de ejecución automática o con la de búsqueda.	

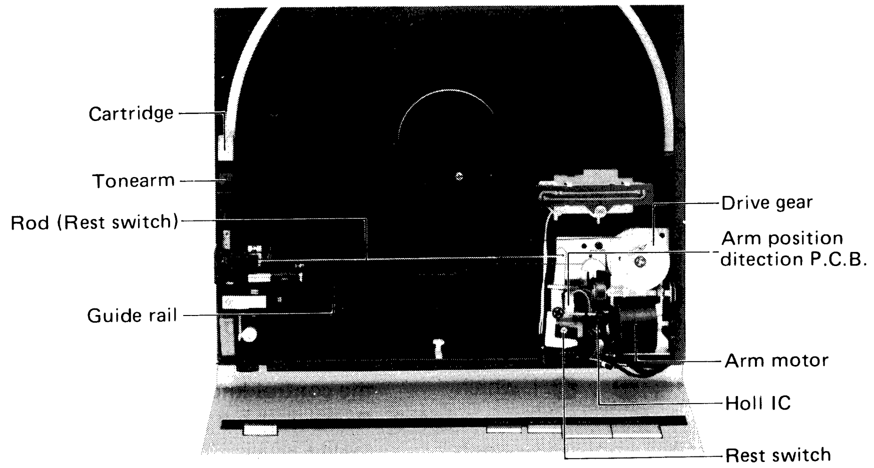
Printed in Japan
830264 00 Ⓗ YW


Tonearm motor control IC
On/off switch
Micro computer
Key switch
Start position adjustment screw
Power transformer
Weight


45 r.p.m. adjuster
33 r.p.m. adjuster
*Synchro-rec jack
Ground
(L)
(R)
Phono output terminals
AC input socket

*Synchro-rec Jack (Synchro-rec Jack is not available)


Optical sensor
Stabilizer
Turntable mat
Turntable platter
Center spindle
45 r.p.m. adaptor
Light guide slit
Record guides
Speed selector
Disc size selector


Cartridge
Tonearm
Rod (Rest switch)
Guide rail
Drive gear
Arm position ditection P.C.B.
Arm motor
Holl IC
Rest switch

■ DISASSEMBLY INSTRUCTIONS

• How to remove the cartridge

1. Open the front cabinet.
2. Completely loosen the cartridge setscrew and then pull out the cartridge. **(Fig. 1)**

• How to remove the turntable platter

1. Open the front cabinet.
2. Turn the 45 r.p.m. adaptor counterclockwise to raise it from the turntable platter.
   *The turntable mat is glued to the turntable platter.
3. Remove the turntable platter. **(Fig. 2)**

Note: Take care not to break the claw by pushing it excessively.

4. Remove the retaining ring from the center spindle. **(Fig. 3)**
5. Hold up the turntable.

* To set the turntable platter

1. Put the turntable platter in place, and fit the cam and retaining ring onto the center spindle.
2. Put on the spring and fit the 45 r.p.m. adaptor.

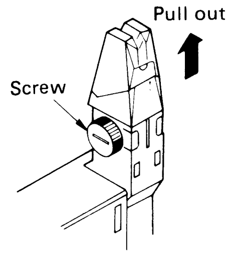
Note: Match the ⇨ on the back of 45 r.p.m. adaptor with the ⇦ of the turntable platter. **(Fig. 4)**

• How to remove the control knob cover

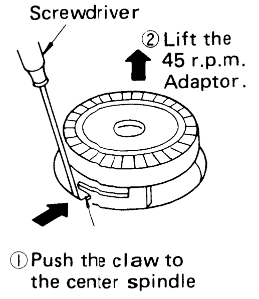
1. Remove the body cover screw caps **(Fig. 5 : ❶ ~ ❸)**.
2. Remove the 7 setscrews **(Fig. 5 : ❹ ~ ❿)** of the body cover.
3. Remove the body cover in the direction of the arrow.

Note: Slightly turn the cover as shown by the arrow because the cover is engaged with the hinge.

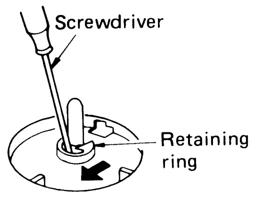
4. Remove the cover setscrew **(Fig. 5 : ⓫)**.
5. Lay down the unit with the front side up as in **Fig. 6**.
6. Remove the 6 setscrews **(Fig. 6 : ⓬ ~ ⓱)** of the bottom cover.
7. Remove the bottom cover in the direction of the arrow. **(Fig. 6)**
8. Remove the 4 setscrews **(Fig. 6 : ⓲ ~ ㉑)** which fasten the control knob cover to the cabinet. Then remove the 2 fitting plates.
9. Remove the control knob cover in the direction of arrow. **(Fig. 6-1)**


Pull out
Screw

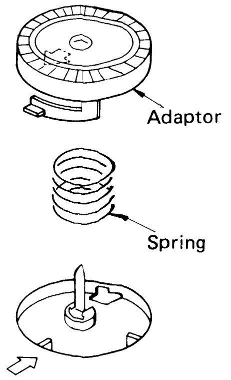
[Fig. 1]


Screwdriver
②Lift the 45 r.p.m. Adaptor.
①Push the claw to the center spindle

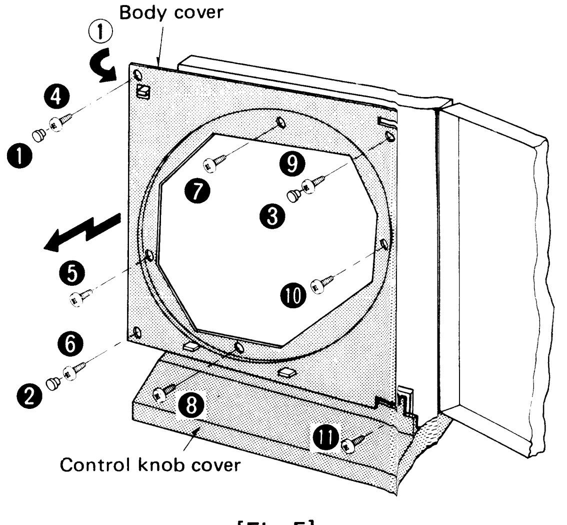
[Fig. 2]


Screwdriver
Retaining ring

[Fig. 3]


Adaptor
Spring

[Fig. 4]


Body cover
①
❹
❶
❾
❼
❸
❺
❿
❻
❷
❽
⓫
Control knob cover

[Fig. 5]

• How to remove the main circuit board

(Microcomputer, arm control and constant voltage circuit)

1. Remove the control knob cover. **(Refer to "How to remove the control knob cover".)**
2. Remove the 6 setscrews **(Fig. 6 : ㉒ ~ ㉗)** of P.C.B.

Note: Remove the P.C.B. cover. **(Fig. 6-2)**

• How to remove the on/off switch and on/off switch knob

1. Lay down the unit with the front side up.
2. Remove the bottom cover. **(Refer to "How to remove the control knob cover" item 6.)**
3. Remove the 2 setscrews **(Fig. 6-3 : ㉒ , ㉘)** which secure the on/off switch cover.
4. Take out the switch and unsolder the knob and switch terminal to remove the switch.

• How to remove the control knob

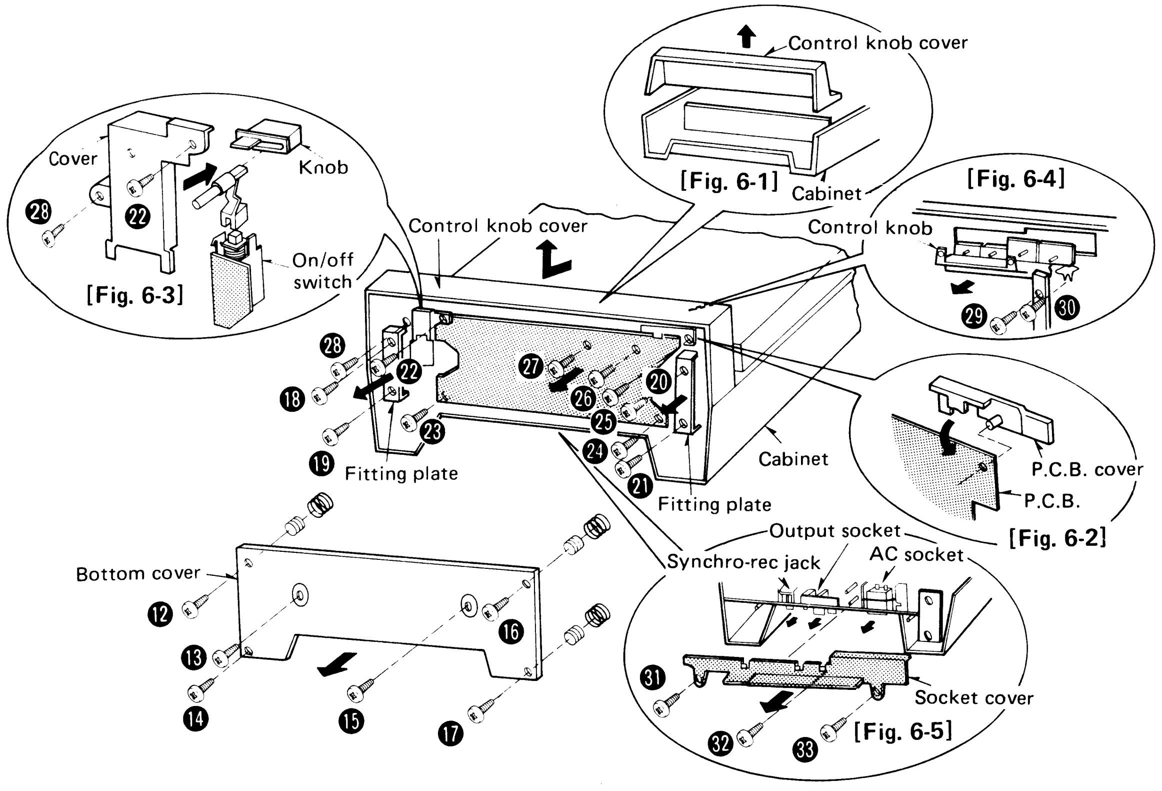
1. Remove the bottom cover. **(Refer to "How to remove the control knob cover" item 6.)**
2. Remove the main circuit board. **(Refer to "How to remove the main circuit board".)**
3. Remove the 2 setscrews **(Fig. 6-4 : ㉙ , ㉚)** of the control knob.
4. Remove the knob in the direction of the arrow.

• How to remove the output socket, AC socket, and synchro-rec jack

1. Remove the bottom cover. **(Refer to "How to remove the control knob cover item 6.")**
2. Remove the 3 setscrews **(Fig. 6-5 : ㉛ ~ ㉝)** of the socket cover.
3. Remove the cover in the direction of the arrow.

Note: Pull out the 2-pin connector (CN1) and then remove the cover.

4. Remove each socket in the direction of the arrow.


Control knob cover
[Fig. 6-1]
Cabinet
[Fig. 6-4]
Control knob
㉙
㉚
Cover
Knob
㉘
㉒
On/off switch
[Fig. 6-3]
Control knob cover
㉘
㉒
⑱
⑲
Fitting plate
㉓
㉗
㉖
⑳
㉕
㉔
㉑
Fitting plate
Cabinet
P.C.B. cover
P.C.B.
[Fig. 6-2]
Output socket
AC socket
Synchro-rec jack
Socket cover
[Fig. 6-5]
㉛
㉜
㉝
Bottom cover
⑫
⑬
⑭
⑮
⑯
⑰

[Fig. 6]

• How to remove the drive circuit board and stator frame

1. Open the front of the unit.
2. Remove the turntable platter. **(Refer to "How to remove the turntable platter".)**
3. Remove the body cover. **(Refer to "How to remove the control knob cover".)**
4. Remove the 6 setscrews **(Fig. 7 : ㉞ ~ ㊳)** of the drive circuit board, and pull out the connector (CN201).
5. Remove the setscrews **(Fig. 7-1 : ㊵ ~ ㊸)** to separate the drive circuit board and the stator frame.

• How to remove the cabinet switch, speed selector switch knob and connection board

1. Open the front of the unit.
2. Remove the turntable platter. **(Refer to "How to remove the turntable platter".)**
3. Remove the body cover. **(Refer to "How to remove the control knob cover".)**
4. Remove the cabinet switch setscrew **(Fig. 7 : ㊹)**.
5. Release the switch cover claw from the board and then remove the switch cover. **(Fig. 7-2)**
   Unsolder the switch terminal to remove the switch.
6. Remove the 2 setscrews **(Fig. 7 : ㊺ , ㊻)** of the speed selector switch knob, and remove the control knob cover. **(Refer to "How to remove the control knob cover".)** The knob can be removed in the direction of the arrow. **(Fig. 7-3)**
7. Remove the 2 setscrews **(Fig. 7 : ㊼ , ㊽)**, and then the connector board can be removed.

• How to remove the dust cover

1. Remove the 4 setscrews **(Fig. 8 : ㊾ ~ (52))** of the dust cover.
2. Remove the dust cover in the direction of the arrow.

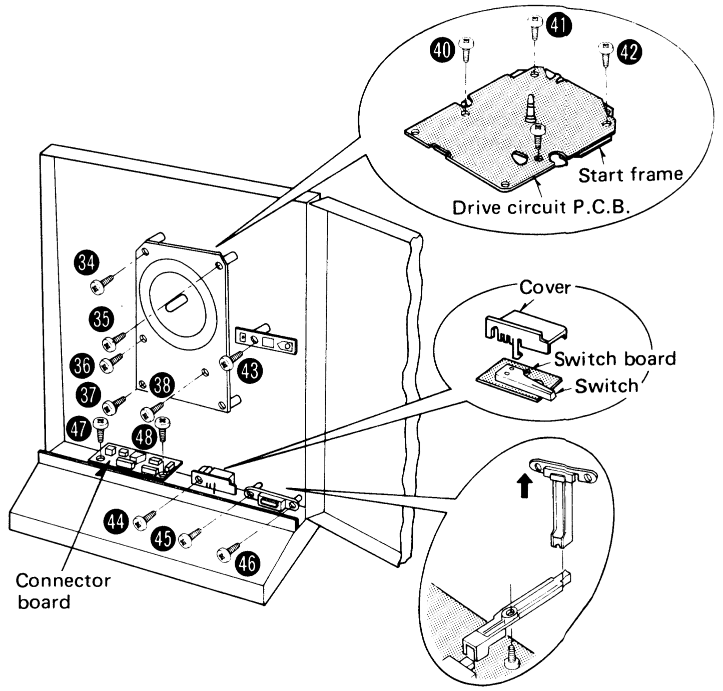
• How to remove the tonearm

1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Turn the worm gear by hand and slightly shift the tonearm inward.
3. Remove the tonearm setscrew **(Fig. 9 : (53))**.
4. Disconnect the output lead wire from the connector board and then remove the tonearm in the direction of the arrow. **(Fig. 9)**

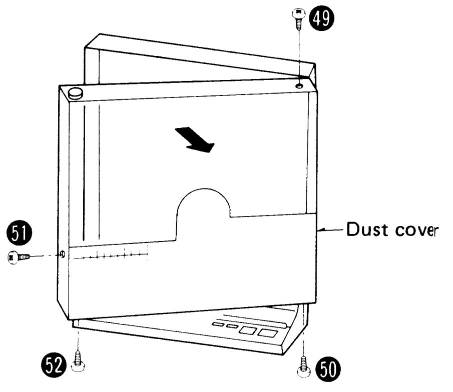
• How to remove the offset angle detection circuit board

1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Remove the stylus indicator cover setscrew **(Fig. 9 : (54))**.
3. Loosen the P.C.B. setscrew **(Fig. 9 : (55))** and lift the P.C.B.

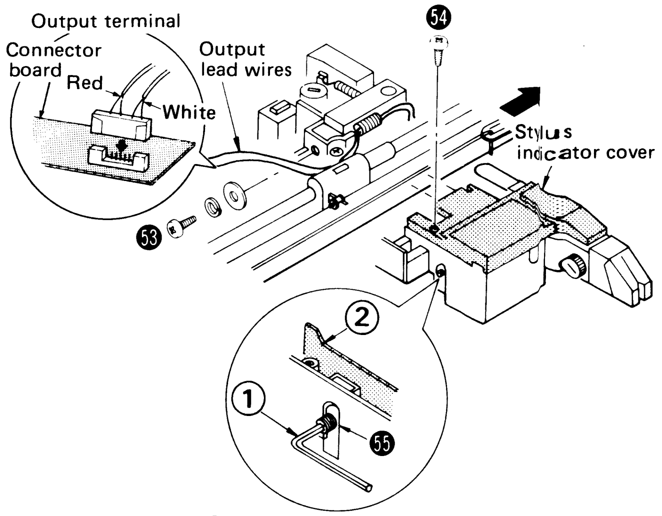
Note: When the P.C.B. is removed, be sure to adjust the servo gain and offset voltage. (Refer to the adjusting procedure on P13.)


㊵
㊶
㊷
Start frame
Drive circuit P.C.B.
Cover
Switch board
Switch
㉞
㉟
㊱
㊲
㊳
㊸
㊼
㊽
㊹
㊺
㊻
Connector board

[Fig. 7]


㊾
(51)
Dust cover
(52)
㊿

[Fig. 8]


(54)
Output terminal
Connector board
Red
White
Output lead wires
Stylus indicator cover
(53)
②
①
(55)

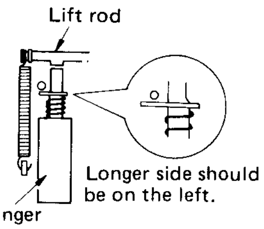
① Turn the hex. rod wrench (M3) to counterclockwise.
② Lift the P.C.B.

[Fig. 9]

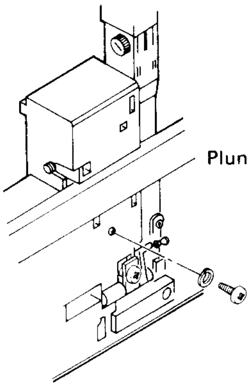
• How to remove the cueing plunger

1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Remove the plunger setscrew (**Fig. 10 : (56)**).
3. Remove the offset angle detection P.C.B. and unsolder the 2 leads of plunger. Then the plunger can be removed.

Note: The plunger should be fitted in the position as in **Fig. 11.**


Lift rod
Longer side should be on the left.

[Fig. 11]

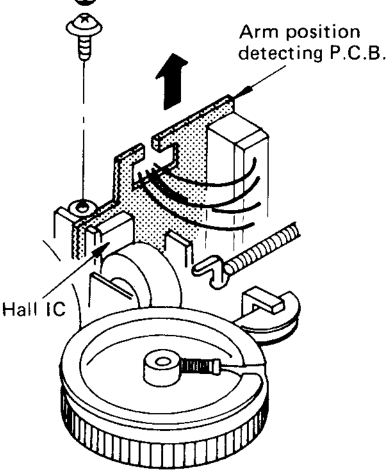


[Fig. 10]

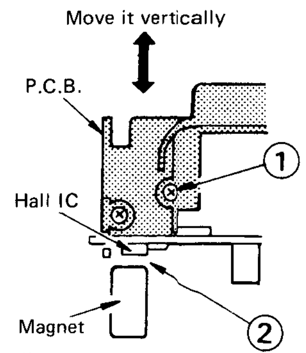
• How to remove the Arm position detecting P.C.B.

1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Remove the P.C.B. setscrew (**Fig. 12 : (57)**).

Note: The clearance between Hall IC and magnet should be 0.8 mm ± 0.2 mm. It can be adjusted as in **Fig. 13.**


22
Arm position detecting P.C.B.
Hall IC

[Fig. 12]

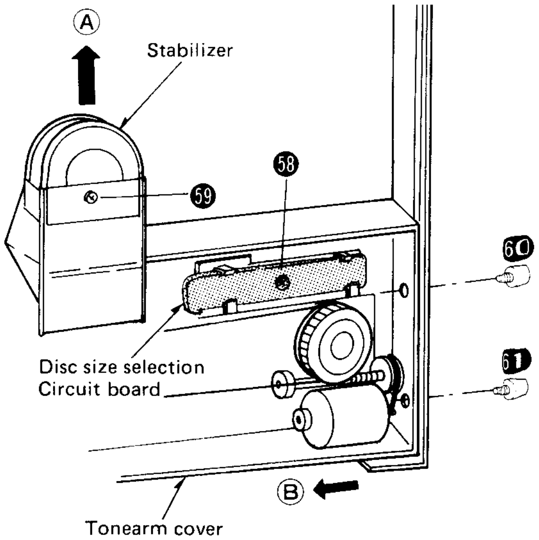

Move it vertically
P.C.B.
Hall IC
Magnet
①
②

Adjusting method
① Loosen the screw.
② Move the P.C.B. so that the clearance between Hall IC and magnet is 0.8 ± 0.2 mm, and then tighten the setscrew.

[Fig. 13]

• How to remove the disc size selector (record size selection P.C.B.), stabilizer, and tonearm cover

1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Remove the disc size selector setscrew (**Fig. 14 : (58)**).
3. Remove the stabilizer setscrew (**Fig. 14 : (59)**).
4. Remove the stabilizer in the direction of the arrow Ⓐ.
5. Remove the tonearm cover setscrews (**Fig. 14 : (60) , (61)**).
6. Remove the tonearm in the direction of the arrow Ⓑ.


Ⓐ
Stabilizer
58
59
60
61
Disc size selection Circuit board
Ⓑ
Tonearm cover

[Fig. 14]

How to remove the hinge

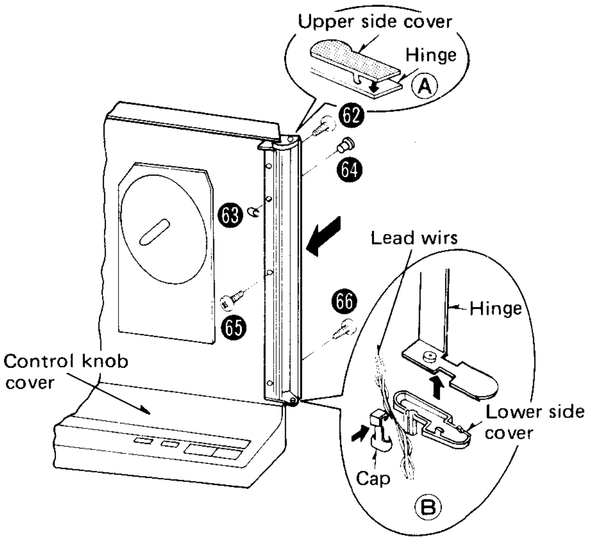
1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Remove the body cover. **(Refer to "How to remove the control knob cover".)**
3. Remove the control knob cover. **(Refer to "How to remove the control knob cover".)**
4. Remove the hinge setscrews and stopper rings **(Fig. 15 : (62) ~ (66)).**
5. Remove the hinge in the direction of the arrow, and then remove the upper and lower side covers of hinge.

* To fit the hinge . . . . .

1. Fit the upper side cover to the hinge. **(Fig. 15 : Ⓐ)**
2. Fit the lower side cover to the hinge. **(Fig. 15 : Ⓑ)**

Note: Fit the leads in the lower side cover groove, and set with leads clamper.

3. Secure the hinge with setscrews **(Fig. 15 : (62) ~ (66)).**

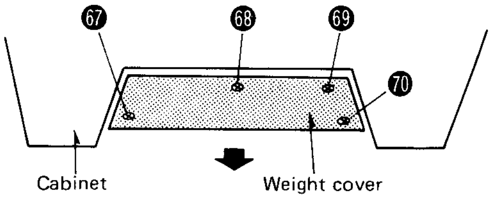

Upper side cover
Hinge
Ⓐ
(62)
(64)
(63)
Lead wirs
(66)
Hinge
(65)
Control knob cover
Lower side cover
Cap
Ⓑ

[Fig. 15]

How to remove the weight

Note: Remember to set the weight when the cabinet is replaced.

1. Lay down the unit with the front side up.
2. Remove the 4 setscrews **(Fig. 16 : (67) ~ (70))** of the weight cover.
3. Remove the cover in the direction of the arrow and take out the weight.

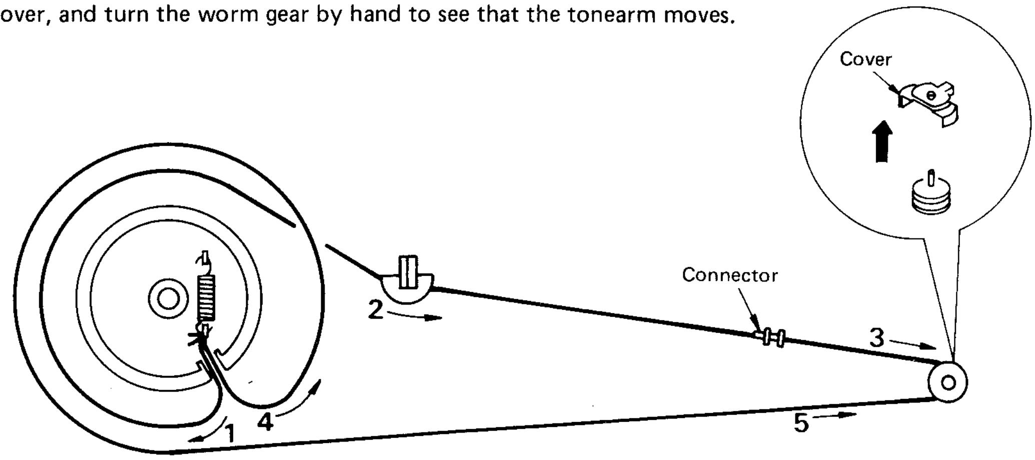

(67)
(68)
(69)
(70)
Cabinet
Weight cover

[Fig. 16]

■ HOW TO SET THE TONEARM DRIVE ROPE

Set the rope according to the following procedure.

1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Remove the roller cover. **(Fig. 17)**
3. Set the rope in the order of 1 ~ 5. **(Fig. 17)**
4. Attach the rope connector to the tonearm.
5. Set the roller cover, and turn the worm gear by hand to see that the tonearm moves.

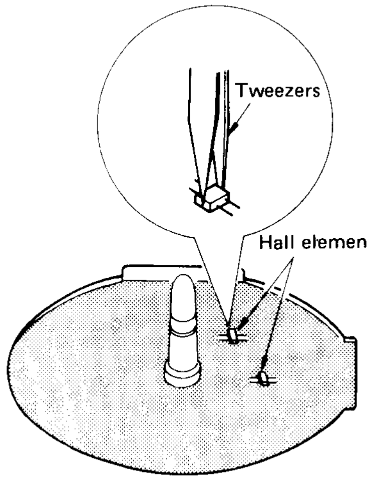

Cover
Connector
2
3
1
4
5

[Fig. 17]

• How to remove Hall element

1. Remove the turntable platter.
2. Remove the terminal solder by use of solder sucker.
3. Hold the Hall element with a tweezers and remove it while touching the soldering iron to the terminal.

Note: Fit the Hall element with the part No. printed up. The revers in terminal position is allowable provided that the printed side is up.



[Fig. 18]

■ HOW TO REPLACE CHIPS (RESISTORS)

• Replacing procedure

1. Put solder on the foil where the chip is fitted, and then solder the chip by touching the soldering iron to it as shown in **Fig. 19**.

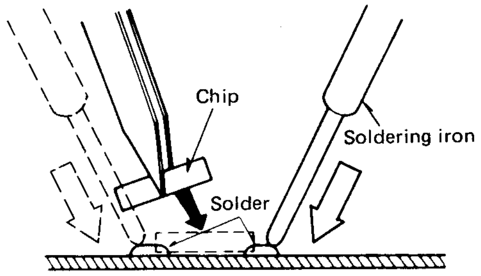
• Removing procedure

1. Completely unsolder the both ends of the chip bu use of solder sucker.
2. Remove chip with tweezers by rotating it while removing solder as shown in **Fig. 20**.

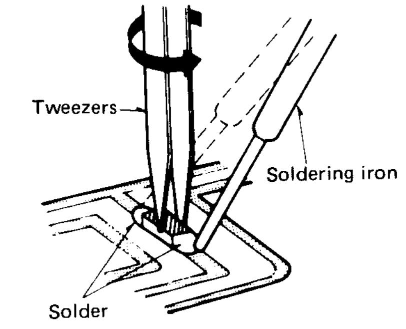
Note: Do not use chip again which is removed from P.C.B.

[Note for replacing chips]

1. Do not heat the chip more than 3 seconds.
2. Do not rub the electrode against the chip.
3. Use the tweezers with care not to damage the surface of the chip.
4. It is desirable to use a pencil type soldering iron. And use soldering ilon less than 60 W.

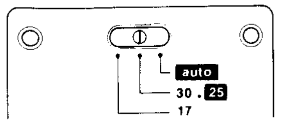
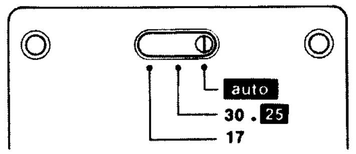


[Fig. 19]



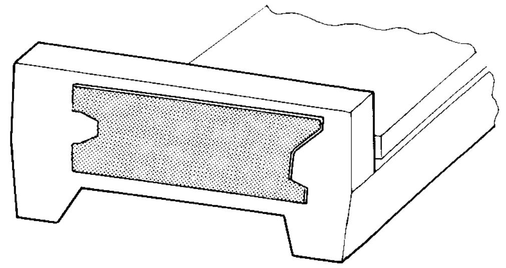
[Fig. 20]

■ The turntable may not perform as expected when playing the following kinds of records. This does not mean that there is anything wrong with the turntable. In such cases, follow the directions below.

Record		Operation	Notes
■ **25 cm records.**  		1. Set the disc size selector at the "30. 25" position. 2. **Hold down the start switch so that the tonearm moves over to a position above the desired record's lead-in grooves.** 3. Push the cueing control.	**• Ordinarily, the disc size selector should be left at the "auto" position.**  **• Repeat play is not possible for 25 cm records or records that do not meet the industry standard dimensions because size is not automatically detected.** **• Set the speed selector to 33 or 45 depending on the correct speed for the record in question.** **• In some cases it is not possible to play records that do not meet the industry standard dimensions.**
■ **Records that are transparent, colored or translucent black-any record that does not completely block light.**	30 cm record	1. Set the disc size detector at the "30. 25" position. 2. Use with the auto play or search play mode.	
	17 cm record	1. Set the disc size detector at the "17" position. 2. Use with the auto play or search play mode.	

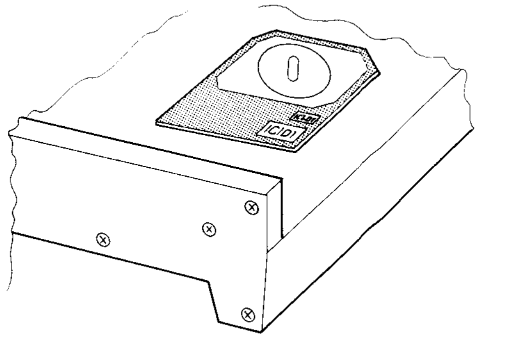
■ CHECKING METHOD (Refer to "Disassembly Instructions")

1. **Main P.C.B. checking method (Fig. A)**
   1) Lay down the unit.
   2) Remove the bottom plate.
   3) Put on the record and check each circuit from the bottom of the unit.



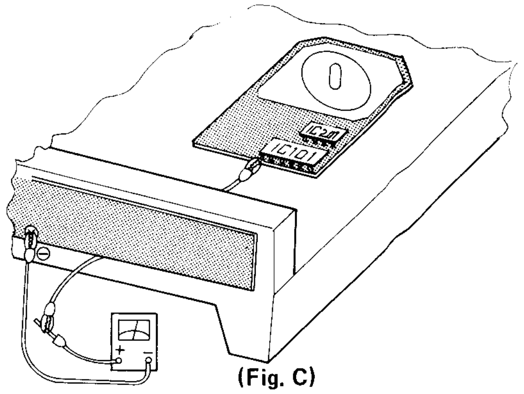
(Fig. A)

2. **Turntable drive circuit checking method (in stop mode) (Fig. B).**
   1) Lay down the unit.
   2) Open the front cabinet.
   3) Remove the turntable platter.
   4) Turn on the on/off switch and check the drive circuit.



(Fig. B)

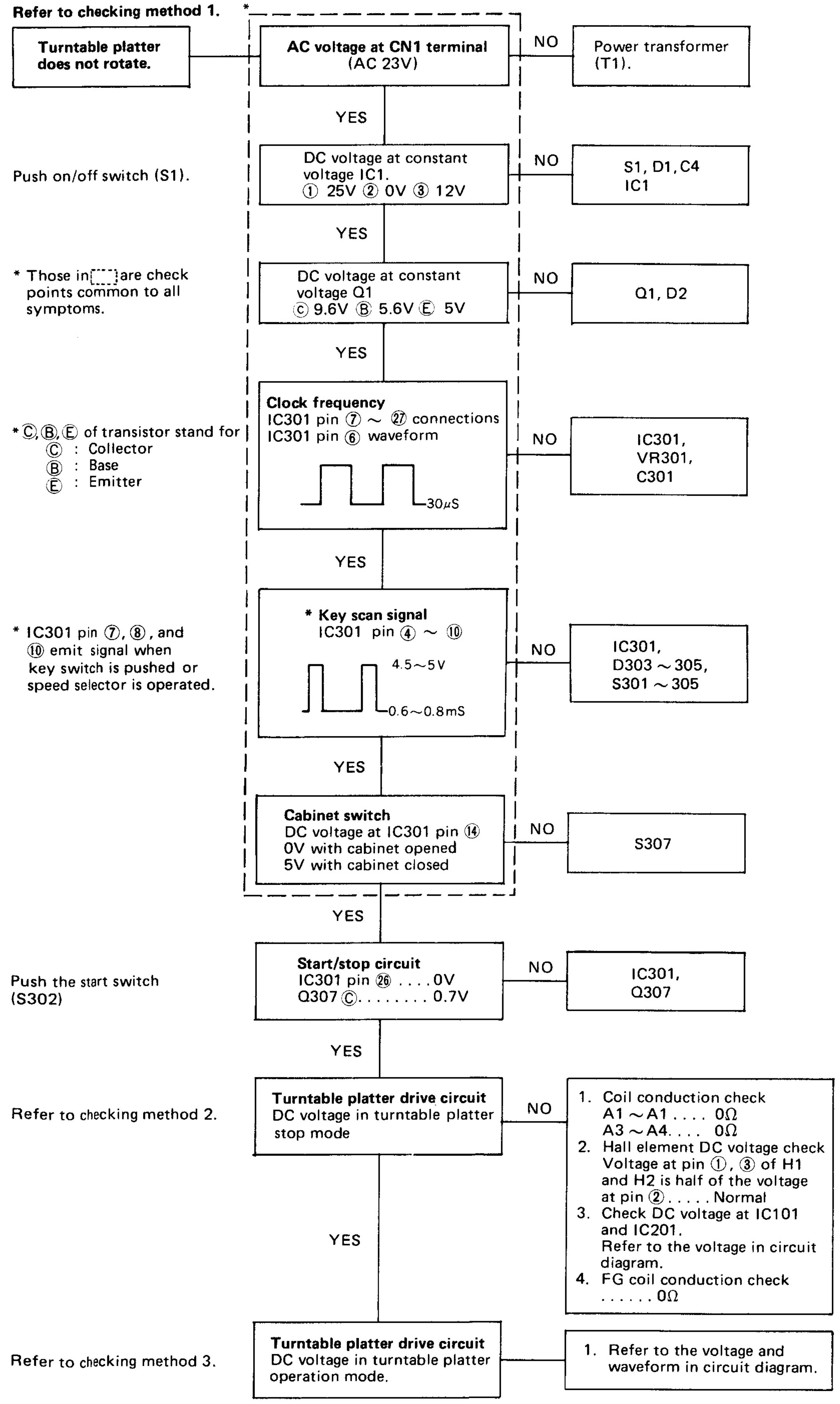
3. **Turntable drive circuit checking method (in operation mode) (Fig. C)**
   1) Lay down the unit.
   2) Remove the bottom plate.
   3) Open the front cabinet and remove the turntable platter.
   4) Insert the lead into the gap at the bottom and connect it to the probe. (When use oscilloscope and tester)
   5) Set the turntable platter and turn on the power switch to start the turntable.
   6) Check the circuit in turntable operation mode.

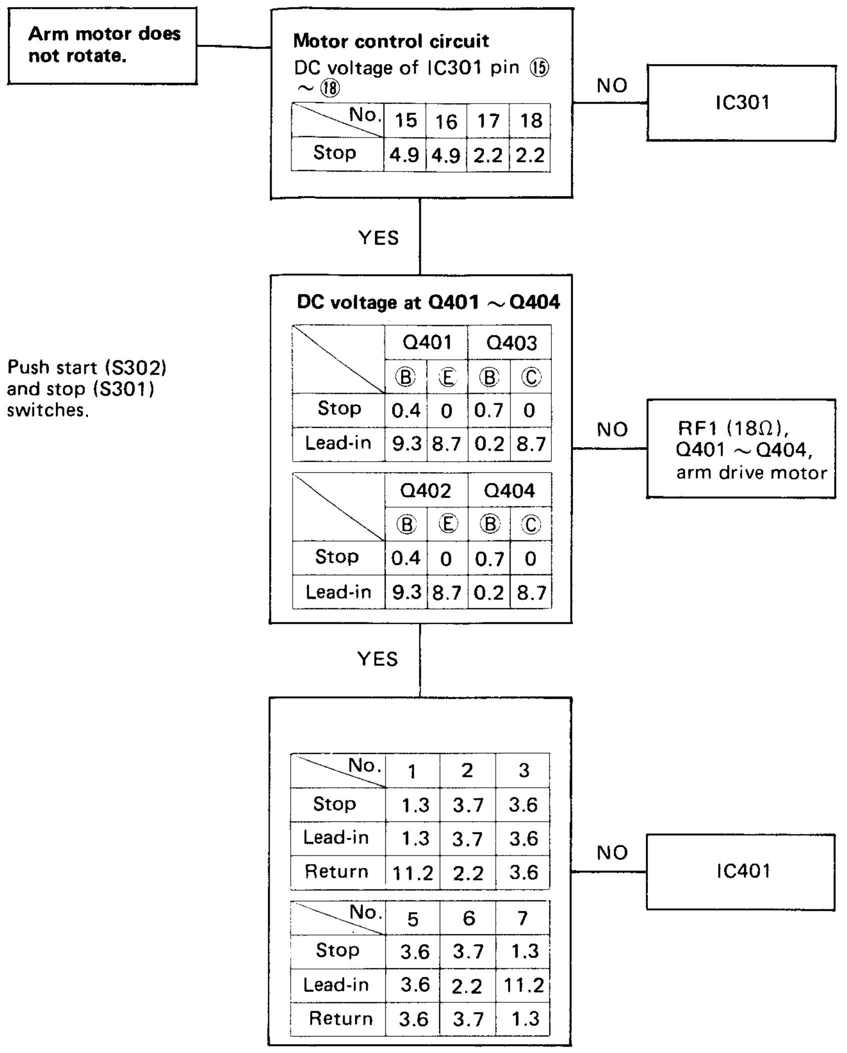


(Fig. C)

4. **Offset angle detecting sensor and Arm position detecting Hall IC checking method**
   1) Remove the dust cover.
   2) Check each circuit.

■ TROUBLE SHOOTING


Refer to checking method 1.
Turntable platter does not rotate.
AC voltage at CN1 terminal (AC 23V)
NO
Power transformer (T1).
YES
Push on/off switch (S1).
DC voltage at constant voltage IC1. ① 25V ② 0V ③ 12V
NO
S1, D1, C4 IC1
YES
* Those in [ ] are check points common to all symptoms.
DC voltage at constant voltage Q1 Ⓒ 9.6V Ⓑ 5.6V Ⓔ 5V
NO
Q1, D2
YES
* Ⓒ, Ⓑ, Ⓔ of transistor stand for
Ⓒ : Collector
Ⓑ : Base
Ⓔ : Emitter
Clock frequency
IC301 pin ⑦ ~ ㉗ connections
IC301 pin ⑥ waveform
30μS
NO
IC301, VR301, C301
YES
* IC301 pin ⑦, ⑧, and ⑩ emit signal when key switch is pushed or speed selector is operated.
* Key scan signal
IC301 pin ④ ~ ⑩
4.5~5V
0.6~0.8mS
NO
IC301, D303 ~ 305, S301 ~ 305
YES
Cabinet switch
DC voltage at IC301 pin ⑭
0V with cabinet opened
5V with cabinet closed
NO
S307
YES
Push the start switch (S302)
Start/stop circuit
IC301 pin ㉖ 0V
Q307 Ⓒ. 0.7V
NO
IC301, Q307
YES
Refer to checking method 2.
Turntable platter drive circuit
DC voltage in turntable platter stop mode
NO
1. Coil conduction check
A1 ~ A1 . . . . 0Ω
A3 ~ A4. . . . 0Ω
2. Hall element DC voltage check
Voltage at pin ①, ③ of H1 and H2 is half of the voltage at pin ②. . . . . Normal
3. Check DC voltage at IC101 and IC201.
Refer to the voltage in circuit diagram.
4. FG coil conduction check 0Ω
YES
Refer to checking method 3.
Turntable platter drive circuit
DC voltage in turntable platter operation mode.
1. Refer to the voltage and waveform in circuit diagram.


Arm motor does not rotate.
Motor control circuit
DC voltage of IC301 pin ⑮ ~ ⑱
NO
IC301
YES
Push start (S302) and stop (S301) switches.
DC voltage at Q401 ~ Q404
NO
RF1 (18Ω), Q401 ~ Q404, arm drive motor
YES
NO
IC401

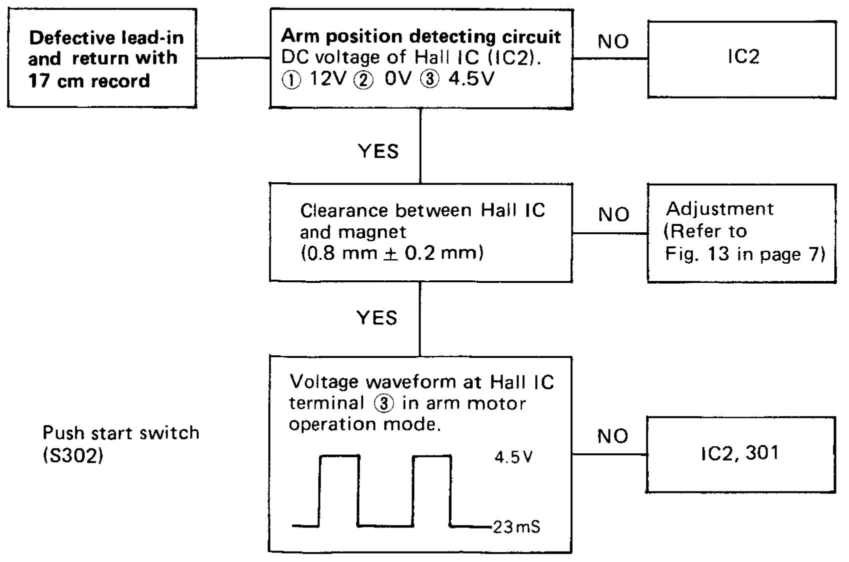
No.	15	16	17	18
Stop	4.9	4.9	2.2	2.2

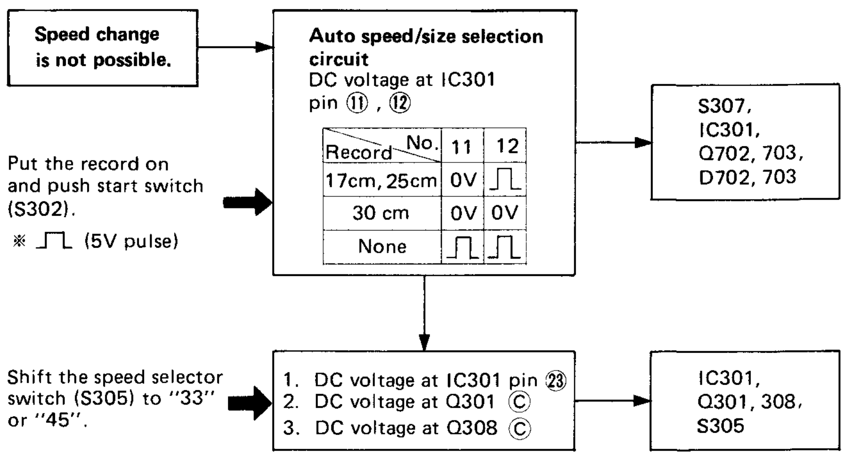
	Q401		Q403	
	Ⓑ	Ⓔ	Ⓑ	Ⓒ
Stop	0.4	0	0.7	0
Lead-in	9.3	8.7	0.2	8.7

	Q402		Q404	
	Ⓑ	Ⓔ	Ⓑ	Ⓒ
Stop	0.4	0	0.7	0
Lead-in	9.3	8.7	0.2	8.7

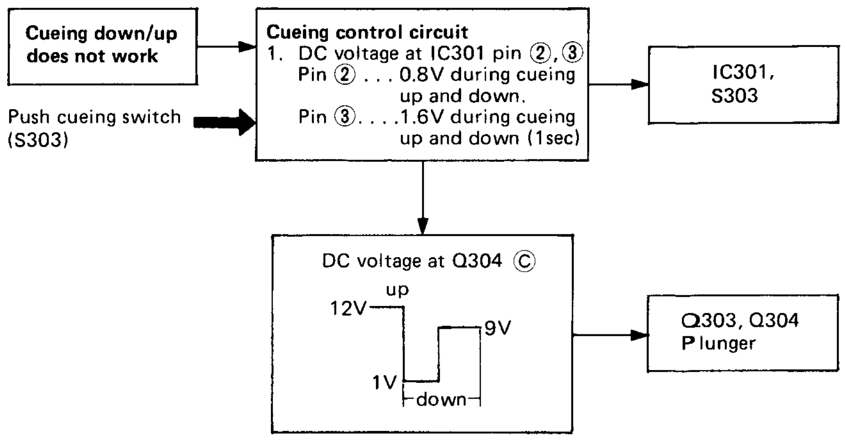
No.	1	2	3
Stop	1.3	3.7	3.6
Lead-in	1.3	3.7	3.6
Return	11.2	2.2	3.6

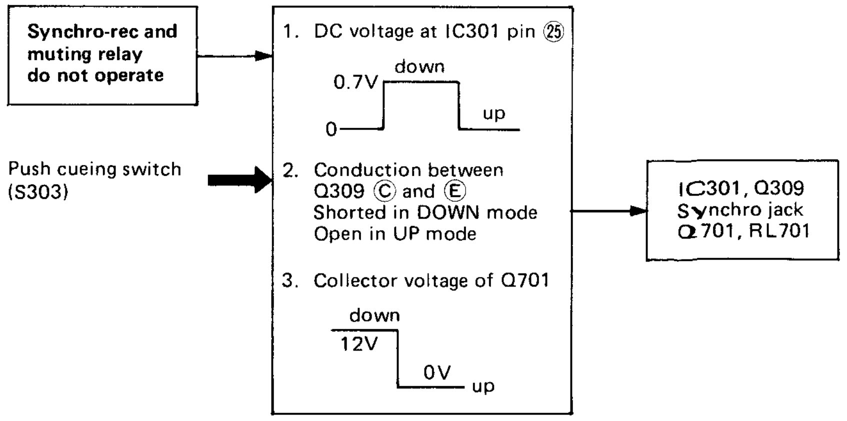
No.	5	6	7
Stop	3.6	3.7	1.3
Lead-in	3.6	2.2	11.2
Return	3.6	3.7	1.3


Defective lead-in and return with 17 cm record
Arm position detecting circuit
DC voltage of Hall IC (IC2).
① 12V ② 0V ③ 4.5V
NO
IC2
YES
Clearance between Hall IC and magnet (0.8 mm ± 0.2 mm)
NO
Adjustment (Refer to Fig. 13 in page 7)
YES
Push start switch (S302)
Voltage waveform at Hall IC terminal ③ in arm motor operation mode.
4.5V
23mS
NO
IC2, 301


Speed change is not possible.
Auto speed/size selection circuit
DC voltage at IC301 pin ⑪, ⑫
S307, IC301, Q702, 703, D702, 703
Put the record on and push start switch (S302).
※ ⎍ (5V pulse)
Shift the speed selector switch (S305) to "33" or "45".
1. DC voltage at IC301 pin ㉓
2. DC voltage at Q301 Ⓒ
3. DC voltage at Q308 Ⓒ
IC301, Q301, 308, S305

Record \ No.	11	12
17cm, 25cm	0V	⎍
30 cm	0V	0V
None	⎍	⎍


Cueing down/up does not work
Cueing control circuit
1. DC voltage at IC301 pin ②, ③
Pin ② . . . 0.8V during cueing up and down.
Pin ③. . . .1.6V during cueing up and down (1sec)
Push cueing switch (S303)
IC301, S303
DC voltage at Q304 Ⓒ
up
12V
9V
1V
down
Q303, Q304 Plunger


Synchro-rec and muting relay do not operate
1. DC voltage at IC301 pin ㉕
down
0.7V
0
up
Push cueing switch (S303)
2. Conduction between Q309 Ⓒ and Ⓔ
Shorted in DOWN mode
Open in UP mode
3. Collector voltage of Q701
down
12V
0V
up
IC301, Q309 Synchro jack Q701, RL701

■ MEASUREMENTS AND ADJUSTMENT

• Equipment used and condition of the set

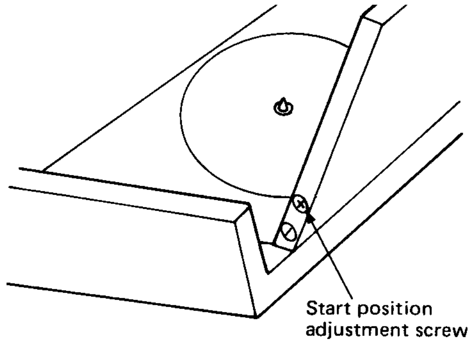
1. Oscilloscope
2. DC voltmeter
3. 30 cm record
4. Screwdrivers ⊕ , ⊖
5. Hex. rod wrench (M3)

Step	Item	Preparations	Portion	Procedure
1	Start position	1. Put 30 cm record on and close the front cabinet. 2. Turn on the on/off switch. 3. Push the start switch.	Start position screw **(Fig. 21)**	1. Open the front cabinet. 2. If the tonearm drops between tunes, adjust it by turning the screw counterclockwise. 3. If the tonearm drops to outside the record, adjust it by turning the screw clock wise.
2	Tonearm offset angle	1. Open the front cabinet, and hold the cabinet switch with tape. 2. Blind the 2 inside light guide slits with 2 black tapes. 3. Turn on the on/off switch. Push the start switch to shift the tonearm inward.	Offset angle adjustment screw **(Fig. 23)**	1. Turn the offset angle adjustment screw so that the tonearm center matches the V-groove of lift rod.
3	Servo gain	1. Connect the voltmeter to CN303 terminal 3 (+) and 2 (–) of main P.C.B. **(Fig. 22)** 2. Turn on the on/off switch.	VR501 **(Fig. 24)**	1. Completely shift the tonearm to the right. 2. Adjust the VR501 so that the output voltage is 3.6V.
4	Offset voltage	1. Connect DC voltmeter to CN303 terminal ③ (+) and ② (–) of main P.C.B. **(Fig. 22)** 2. Turn on the on/off switch.	Offset voltage adjustment screw **(Fig. 24)**	1. Shift the tonearm to the center. 2. Turn the adjustment screw so that the output voltage is 1.8V. (Use hex. rod wrench.)
5	Clock frequency	1. Connect Q1 emitter and IC301 pin ⑦ with a jumper. **(Fig. 22)** 2. Connect the oscilloscope to IC301 pin ⑥.	VR301 **(Fig. 22)**	1. Turn on the on/off switch. 2. Adjust VR301 so that the output waveform cycle is 30μs ± 1 μs.
6	Rotating speed	1. Open the front cabinet, and put the record on.. 2. Put the stroboscope on. 3. Close the front cabinet.	VR201 (45 r.p.m.) VR202 (33 r.p.m.)	1. Turn on the on/off swifch. 2. Set the speed selector switch to 45 r.p.m. 3. Adjust VR201 so that the speed is at the rating speed (45 r.p.m.). 4. Set the speed selector switch to 33 r.p.m. 5. Adjust VR202 so that the speed is at the rating speed (33-1/3 r.p.m.) **Note:** Be sure to adjust the speed 45 r.p.m. first.

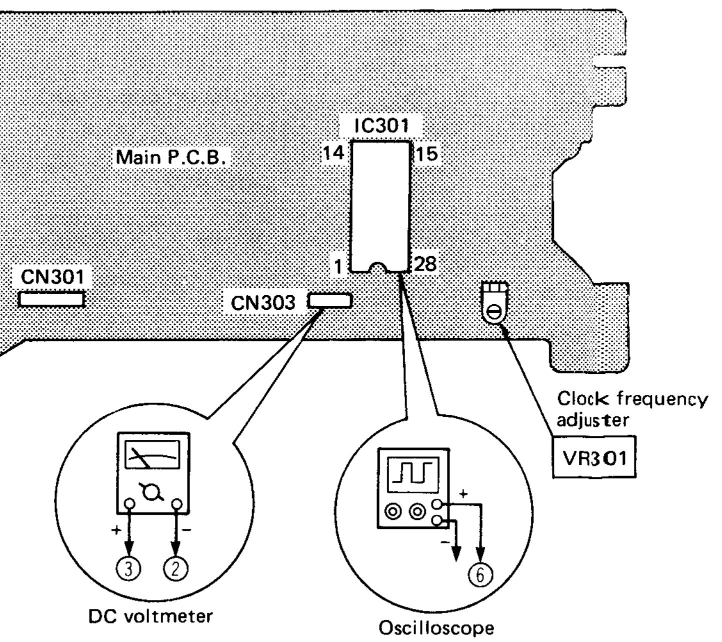
■ TERMINAL DESCRIPTION OF MN1421FPC

* **Mentioned here are the basic functions of the MN1421FPC.**
So, there may be terminals not needed or partial change in circuit function depending on the using method.

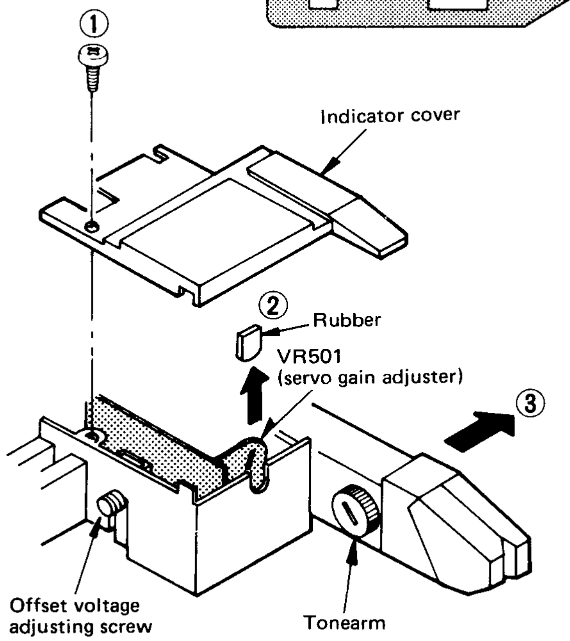
No.	Symbol	Description	No.	Symbol	Description
1	VSS	Grand terminal	11 12	Bi3 Bi2	Auto size and speed change terminals (Terminals ⑪ , ⑫ at "L" → 30 cm record 33 r.p.m. ⑪ at "L", ⑫ at "H" → 17 cm record 45 r.p.m.)
2	CO9	Cueing control terminal ("H" during cueing up and down)			
3	CO8	Cueing control terminal ("H" only during cueing down for about 1 sec.)	13	Bi1	Rest position detecting terminal ("H" when tonearm is in rest position.)
4 5 6	CO7 CO6 CO5	Key scan output terminal	14	Bi0	Cabinet open/close detecting terminal
7 8 9 10	Ai3 Ai2 Ai1 Ai0	Key scan input terminal	15 16 17 18	EO0 EO1 EO2 EO3	Tonearm drive motor control terminal (arm servo)
			19	TEST	Test terminal (nut used, connected to grand)
			20	RST	Reset terminal (micon is reset at "L")
21	SNS1	Offset angle detecting output/input terminal	25	DO2	Synchro-rec on/off terminal ("L" at on; "L" at off)
22	SNS1	Arm position detecting input terminal			
23	DO0	Turntable platter speed change terminal ("H" at 45 r.p.m.; "L" at 33 r.p.m.)	26	DO3	Turntable platter start/stop terminal ("L" at start; "H" at stop)
24	DO1	Repeat indicator terminal (ON at "L")	27	VDD	Power supply (+5V)
			28	OSC	Oscillation terminal (clock frequency is adjusted to 30μs ± 1μs)



[Fig. 21]

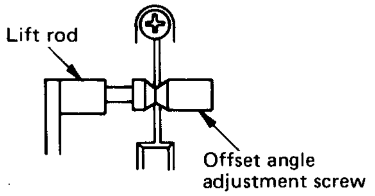


[Fig. 22]



①Remove the indicator cover.
②Remove the rubber
③Shift the tonearm in the direction on the arrow during servo gain adjustment.

[Fig. 24]



[Fig. 23]

■ REPLACEMENT PARTS LIST...Electric Parts

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
Components indentified by ⚠ make have special characteristcs important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Areas
- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [XL] is available in Australia.
- * [EG] is available in F.R. Germany.
- * [EB] is available in Belgium.
- * [EH] is available in Holland.
- * [EF] is available in France.
- * [Ei] is available in Italy.
- * [EC] is available in Czechoslovakia.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XM] is available in Central South America.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	AN7812	Regulator
IC2	DN6838S	Arm Position Detector
IC101	AN6636	Drive
IC201	AN6552	F.G.Amplifier & Constant Voltage (Hall Element)
IC301	MN1421FPC	Micro Computer
IC401	AN6554	Operation Amplifier
TRANSISTORS		
Q1	2SD638	Regulator
Q301,303	2SD636	Speed Selector, Cueing Drive
Q304	2SD892	Cueing Drive
Q305	2SB641	Offset Angle Detector
Q306,307	2SD636	Offset Angle Detector
Q308	2SB641	Speed Selector
Q309	2SD636	Synchro-rec Selector
Q401,402	2SD973	Arm Motor Control
Q403,404	2SD638	Arm Motor Control
Q701	2SD636	Muting Drive
Q702,703	PN150MS	Disk Size Selector

Ref. No.	Part No.	Description
DIODES		
D1 ⚠	SVDS1RBA20F	Rectifier
D2 S	MA1056	5.6V Zener
D301 S	RVDRD7R5FB	7.5V Zener
D302	LN81CPH	Light Emitting Diode(Repeat)
D303~305 S	MA162A	Key Matrix
D501 S	MA162A	Diode
D503	SVDEBR3432S	Light Emitting Diode(Stylus Position)
D701 S	MA162A	Muting Relay Drive
D702,703	SVDEBR5505S	Light Emitting Diode(Record Size)
PHOTO INTERRUPTER		
PC501	ON1186	Offset Angle Detector
SWITCHES		
SI ⚠	SFDSCO5N08	On/off(Power)
S301~304	EVQQJRO2K	Start, Stop, Cueing & Repeat
S305	SFDSHSW0757	Speed Selector
S307	SFDSCO5NO1	Cabinet
S601	SFDSCO2N03	Rest
S901	SFDSHXW225−2	Voltage Selecter

Ref. No.	Part No.	Description
HALL ELEMENTS		
H1,2	OH−002	Turntable Position Detector
VARIABLE RESISTORS		
VR201 S	EVTS3MA00B54	45r.p.m. Adjuster 50kΩ(B)
VR202 S	EVTS3MA00B54	33r.p.m. Adjuster 50kΩ(B)
VR301	EVNK6AA00B54	Clock Frequency Adjuster 50kΩ(B)
VR501 S	EVNM0AA00B53	Servo Gein Adjuster 5kΩ(B)
RELAY		
RL701	SFDYQ11N02	Muting
POWER TRANSFORMER		
TI (EX.XL) ⚠	SLT57DTE10E	Power Sourse
TI (XA) ⚠	SLT57DT11E	Power Sourse
TI (Other Area) ⚠	SLT57DT9E	Power Sourse
FUSE		
F1 (XA)only ⚠	XBA2C016TR0	160mA, 250V
F2 (XA)only ⚠	XBA2C06TR0	630mA, 250V
F2 (Other Areas) ⚠	XBA2C06TR0	630mA, 250V

■ RESISTORS AND CAPACITORS

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. This " **S** " mark is service standard parts and may differ from production parts.
4. Unless otherwise specified.
All resistors are in OHMS (Ω) K = 1000Ω, M = 1000kΩ
All capacitors are in MICROFARADS (μF) P = μμF
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value
ERG	1	AN	J	2R2
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	25 : 1/4W	J : ±5%
ERG : Metal Oxide	1 : 1W	G : ±2%

ERD2FCG□□□ ⟶ Fuse type carbon (1/4W)

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
ECKD	Voltage	Value	Tolerance	Peculiarity
ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Capacitor Type	Voltage		Tolerance
	ECEA Type	Others	
ECEA : Electrolytic	1A : 10V	1H : 50V DC	J : ±5%
ECEA...N : Non Polar Electrolytic	1C : 16V	2H : 500V DC	K : ±10%
ECKD : Ceramic	1E : 25V		Z : +80%, −20%
ECQM : Polyester	1V : 35V		P : +100%, −0%
ECEB : Electrolytic	1H : 50V		M : ±20%
ECCD : Ceramic	50 : 50V		

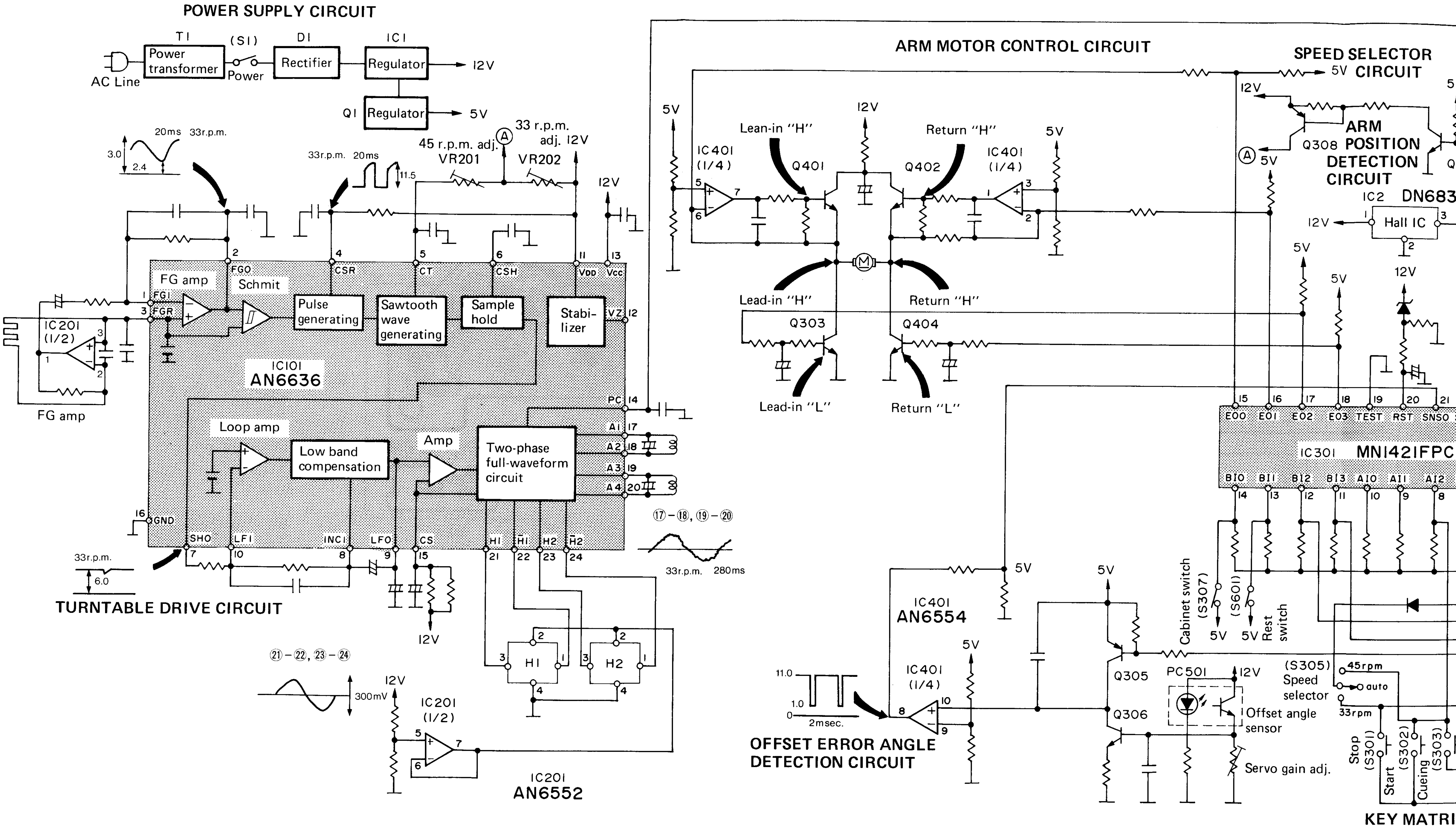
Ref. No.	Part No.	Value
RESISTORS		
R1 S	ERD25FJ681	680
R2 S	ERD25FJ221	220
R3 S	ERG1ANJ390	39
R101 S	ERD10TLJ150U	15
R102 S	ERX1ANJ1R8	1.8
R105	ERD10TLJ153U	15k
R106	ERD10TLJ223U	22k
R201	ERD10TLJ102U	1k
R202	ERD10TLJ153U	15k
R203	ERD10TLJ333U	33k
R204	ERD10TLJ104U	100k
R205	ERD10TLJ473U	47k
R206	ER010MKG1913	191k
R207	ER010MKG5622	56.2k
R221	ERD10TLJ102U	1k
R222	ERD10TLJ153U	15k
R301 S	ERD25TJ273	27k
R302,303 S	ERD25FJ102	1k
R304,305 S	ERD25FJ102	1k
R306 S	ERD25FJ471	470
R308 S	ERD25FJ331	330
R310 S	ERD25FJ562	5.6k
R313,314 S	ERD25TJ333	33k
R315,316 S	ERD25TJ333	33k
R317 S	ERD25FJ102	1k

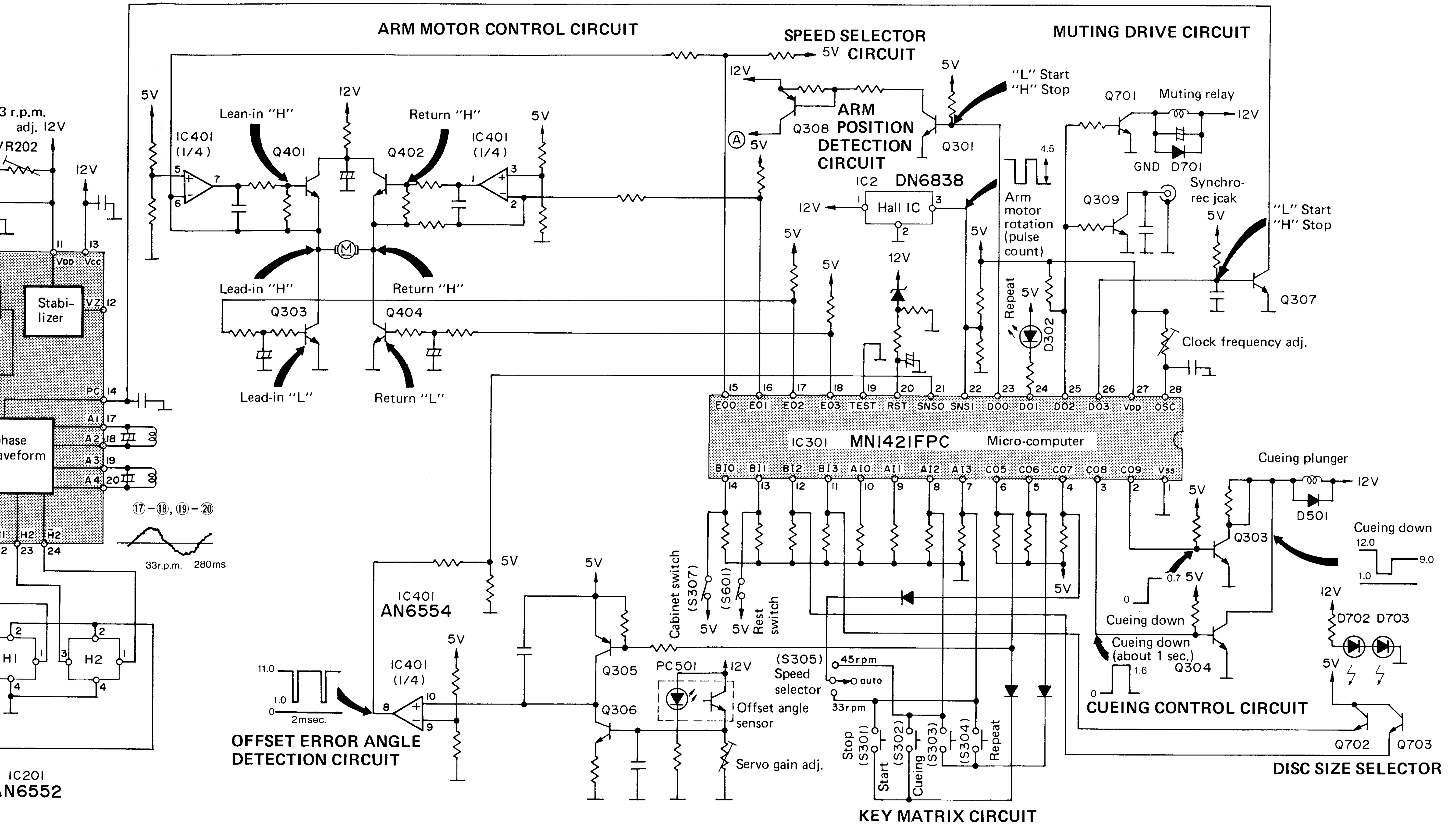
Ref. No.	Part No.	Value
RESISTORS		
R318,319 S	ERD25FJ332	3.3k
R320 S	ERD25FJ272	2.7k
R321,322 S	ERD25FJ331	330
R323 S	ERD25FJ562	5.6k
R324 S	ERD25TJ223	22k
R325 S	ERD25FJ103	10k
R326 S	ERD25FJ272	2.7k
R331 S	ERD25FJ102	1k
R332 S	ERD25FJ562	5.6k
R334	ERD25FJ222	2.2k
R335 S	ERD25FJ332	3.3k
R336 S	ERD25FJ562	5.6k
R337 S	ERD25FJ472	4.7k
R338 S	ERD25FJ471	470
R339 S	ERD25FJ472	4.7k
R340 S	ERD25TJ153	15k
R341 S	ERD25TJ473	47k
R342 S	ERD25FJ332	3.3k
R343 S	ERD25TJ473	47k
R345 S	ERD25FJ472	4.7k
R346 S	ERD25FJ471	470
R347 S	ERD25FJ102	1k
R348 S	ERD25FJ471	470
R349 S	ERD25FJ102	1k
R401,402 S	ERD25TJ683	68k

Ref. No.	Part No.	Value
RESISTORS		
R403 S	ERD25FJ472	4.7k
R404 S	ERD25FJ122	1.2k
R405 S	ERD25FJ222	2.2k
R406 S	ERD25FJ102	1k
R407 S	ERD25TJ224	220k
R408 S	ERD25FJ222	2.2k
R409 S	ERD25FJ102	1k
R410 S	ERD25TJ224	220k
R411 S	ERD25FJ272	2.7k
R412 S	ERD25FJ681	680
R413,414 S	ERD25FJ101	100
R415,416 S	ERD25FJ471	470
R501 S	ERD25FJ391	390
R502 S	ERD25FJ681	680
R503 S	ERD25FJ561	560
R701 S	ERD25FJ102	1k
RF1 ⚠	ERD2FCG180	18
CAPACITORS		
C1,2 S ⚠	ECKD1H223pF	0.022
C3 ⚠	ECQM1223KZ	0.022
C4 S	ECEB1VS222	2200
C5,6 S	ECQM1H104JZ	0.1
C101	ECUV1E333KB	0.033
C102,103 S	ECEA1CN470S	47

Ref. No.	Part No.	Value
CAPACITORS		
C104 S	ECEA1ES101	100
C105 S	ECEA1ES330	33
C201 S	ECEA50Z3R3	3.3
C202	ECQM1H104JZ	0.1
C203 S	ECQM1H333JZ	0.033
C205	ECUV1E473KB	0.047
C206 S	ECQM1H104JZ	0.1
C207 S	ECQM1H104JZ	0.1
C208 S	ECEA25Z4R7	4.7
C209	ECQM1H104JZ	0.1
C210 S	ECEA50ZR22	0.22
C212,213	ECUV1H102MD	0.001
C301 S	ECCD1H680K	68pF
C302 S	ECQM1H104JZ	0.1
C304 S	ECEA1AS470	47
C306 S	ECQM1H104JZ	0.1
C307 S	ECQM1H223JZ	0.022
C308 S	ECEA50Z3R3	3.3
C309	ECKD2H102PE	0.001
C401,402	ECQM1H223JZ	0.022
C403 S	ECEA1CS330	33
C404,405 S	ECEA1AS470	47
C601	ECFB1B104ZM	0.1
C701 S	ECEA1CS101	100

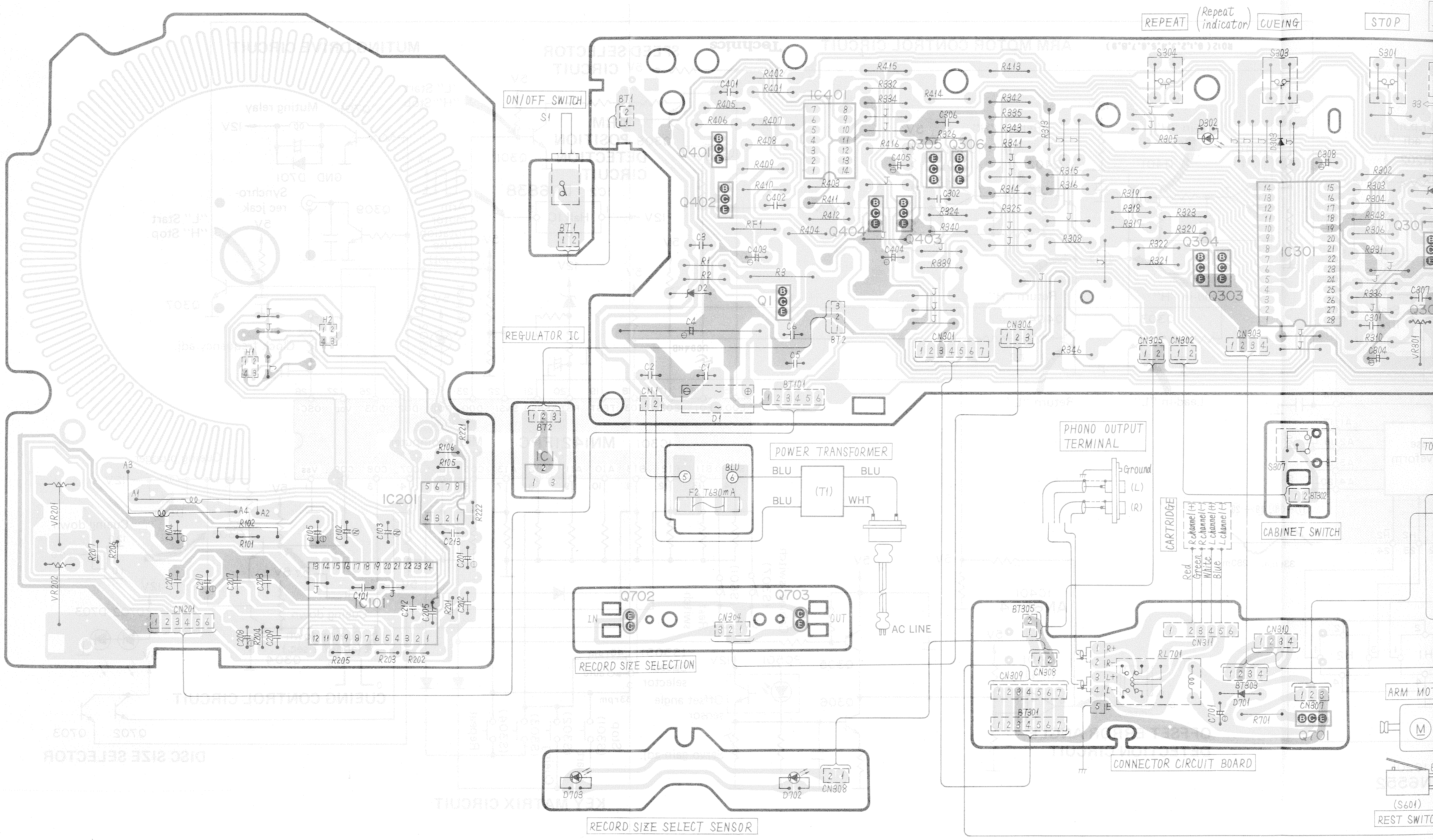
■ BLOCK DIAGRAM


POWER SUPPLY CIRCUIT
T1
(S1)
D1
IC1
AC Line
Power transformer
Power
Rectifier
Regulator
12V
Q1
Regulator
5V
20ms 33r.p.m.
3.0
2.4
33r.p.m. 20ms
11.5
45 r.p.m. adj.
VR201
33 r.p.m. adj.
VR202
12V
FG amp
Schmit
Pulse generating
Sawtooth wave generating
Sample hold
Stabi-lizer
FGO
CSR
CT
CSH
VDD
Vcc
FG1
FGR
VZ
IC201 (1/2)
FG amp
IC101
AN6636
PC
Loop amp
Low band compensation
Amp
Two-phase full-waveform circuit
A1
A2
A3
A4
GND
SHO
LF1
INC1
LFO
CS
H1
H̄1
H2
H̄2
33r.p.m.
6.0
TURNTABLE DRIVE CIRCUIT
⑰-⑱, ⑲-⑳
33r.p.m. 280ms
㉑-㉒, ㉓-㉔
300mV
12V
IC201 (1/2)
IC201
AN6552
ARM MOTOR CONTROL CIRCUIT
5V
IC401 (1/4)
Lean-in "H"
Q401
Q402
Return "H"
Lead-in "H"
Return "H"
Q303
Q404
Lead-in "L"
Return "L"
SPEED SELECTOR CIRCUIT
ARM POSITION DETECTION CIRCUIT
Q308
IC2 DN683
Hall IC
E00
E01
E02
E03
TEST
RST
SNSO
IC301 MN1421FPC
B10
B11
B12
B13
A10
A11
A12
IC401
AN6554
Cabinet switch (S307)
(S601)
Rest switch
Q305
Q306
PC501
Offset angle sensor
Servo gain adj.
(S305) Speed selector
45rpm
auto
33rpm
11.0
1.0
0
2msec.
OFFSET ERROR ANGLE DETECTION CIRCUIT
Stop (S301)
Start (S302)
Cueing (S303)
KEY MATRI

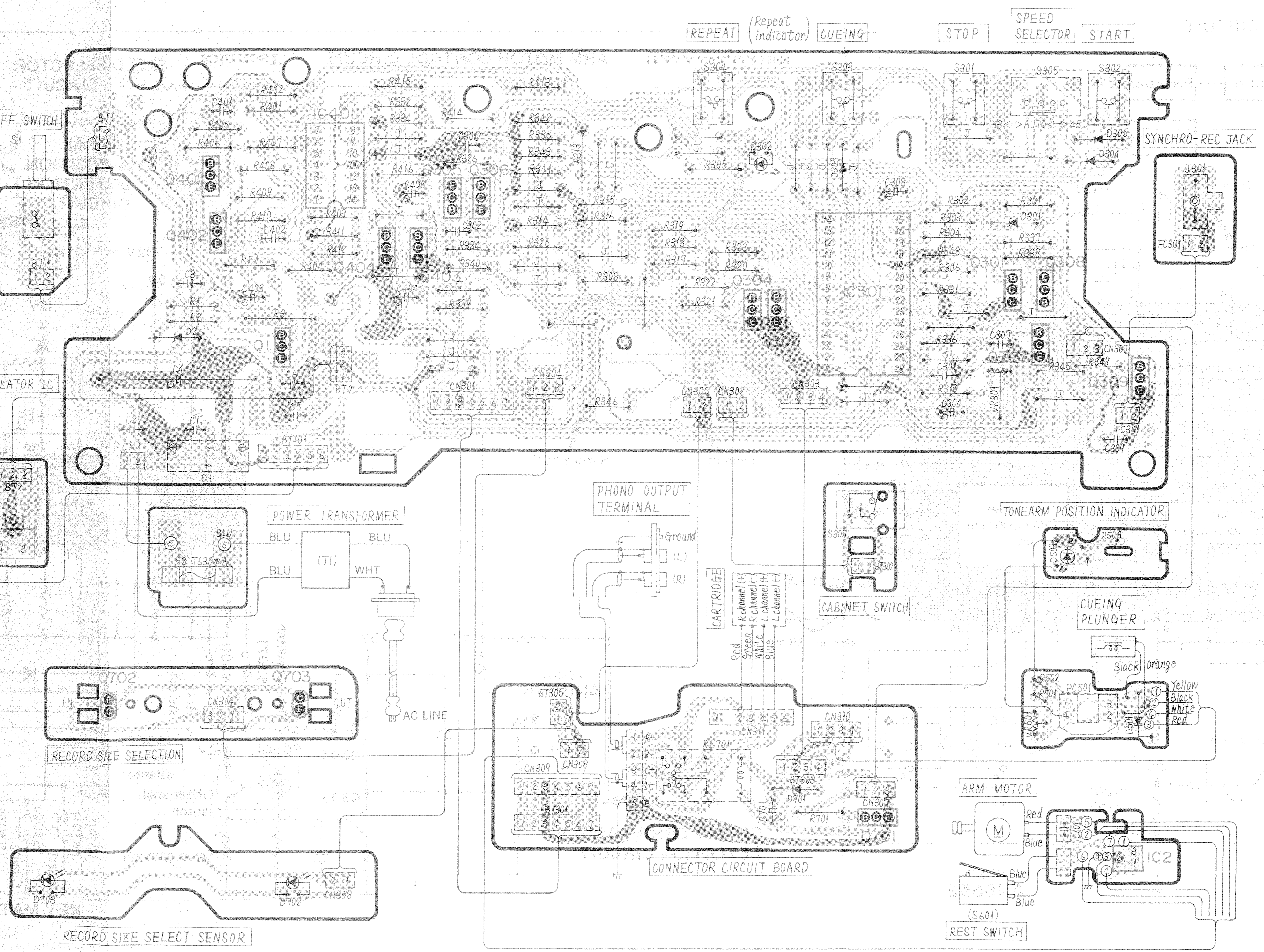

ARM MOTOR CONTROL CIRCUIT
SPEED SELECTOR CIRCUIT
MUTING DRIVE CIRCUIT
ARM POSITION DETECTION CIRCUIT
OFFSET ERROR ANGLE DETECTION CIRCUIT
KEY MATRIX CIRCUIT
CUEING CONTROL CIRCUIT
DISC SIZE SELECTOR
3 r.p.m. adj.
VR202
12V
5V
Lean-in "H"
Return "H"
Lead-in "H"
Lead-in "L"
Return "L"
IC401 (1/4)
Q401
Q402
Q303
Q404
Q308
Q301
Q701
Q309
Q307
Q305
Q306
Q304
Q702
Q703
"L" Start
"H" Stop
Muting relay
GND
D701
Synchro-rec jcak
IC2 DN6838
Hall IC
4.5
Arm motor rotation (pulse count)
Repeat
D302
Clock frequency adj.
Stabi-lizer
VDD
Vcc
VZ
PC
A1
A2
A3
A4
H1
H2
hase
aveform
⑰-⑱, ⑲-⑳
33r.p.m.
280ms
IC201
AN6552
IC301 MN1421FPC Micro-computer
E00 E01 E02 E03 TEST RST SNS0 SNS1 D00 D01 D02 D03 VDD OSC
B10 B11 B12 B13 A10 A11 A12 A13 C05 C06 C07 C08 C09 Vss
IC401 AN6554
11.0
1.0
0
2msec.
PC501
Offset angle sensor
Servo gain adj.
Cabinet switch (S307)
(S601)
Rest switch
(S305) Speed selector
45rpm
auto
33rpm
Stop (S301)
Start (S302)
Cueing (S303)
(S304) Repeat
Cueing plunger
D501
Cueing down
12.0
9.0
0.7
Cueing down (about 1 sec.)
1.6
D702 D703
Ⓐ

■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

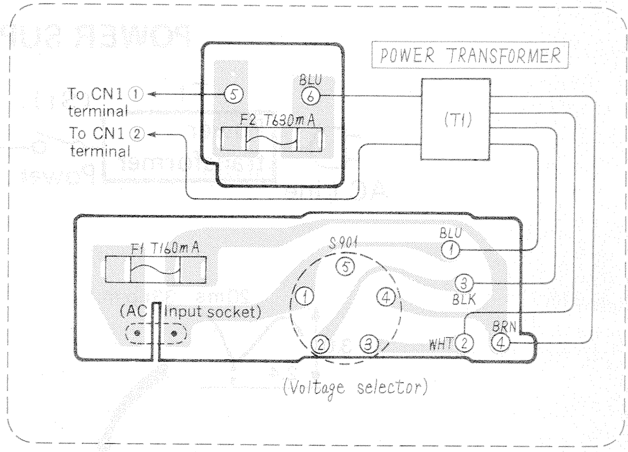
▨ Ground (Earth) lines


REPEAT
(Repeat indicator)
CUEING
STOP
S304
S303
S301
ON/OFF SWITCH
S1
BT1
REGULATOR IC
IC1
BT2
IC401
IC301
IC201
IC101
Q401
Q402
Q404
Q403
Q305
Q306
Q304
Q303
Q1
D302
D303
D1
D2
CN1
BT101
CN301
CN304
CN305
CN302
CN303
CN201
VR201
VR202
H1
H2
A1
A3
A4
A2
PHONO OUTPUT TERMINAL
Ground
(L)
(R)
CARTRIDGE
R channel (+)
R channel (−)
L channel (+)
L channel (−)
Red
Green
White
Blue
POWER TRANSFORMER
BLU
WHT
(T1)
F2 T630mA
AC LINE
Q702
Q703
IN
OUT
CN304
RECORD SIZE SELECTION
D703
D702
CN308
RECORD SIZE SELECT SENSOR
S307
BT302
CABINET SWITCH
BT305
CN311
CN310
CN309
CN308
BT304
RL701
BT303
D701
C701
R701
CN307
Q701
CONNECTOR CIRCUIT BOARD
ARM MOT
M
(S601)
REST SWITC

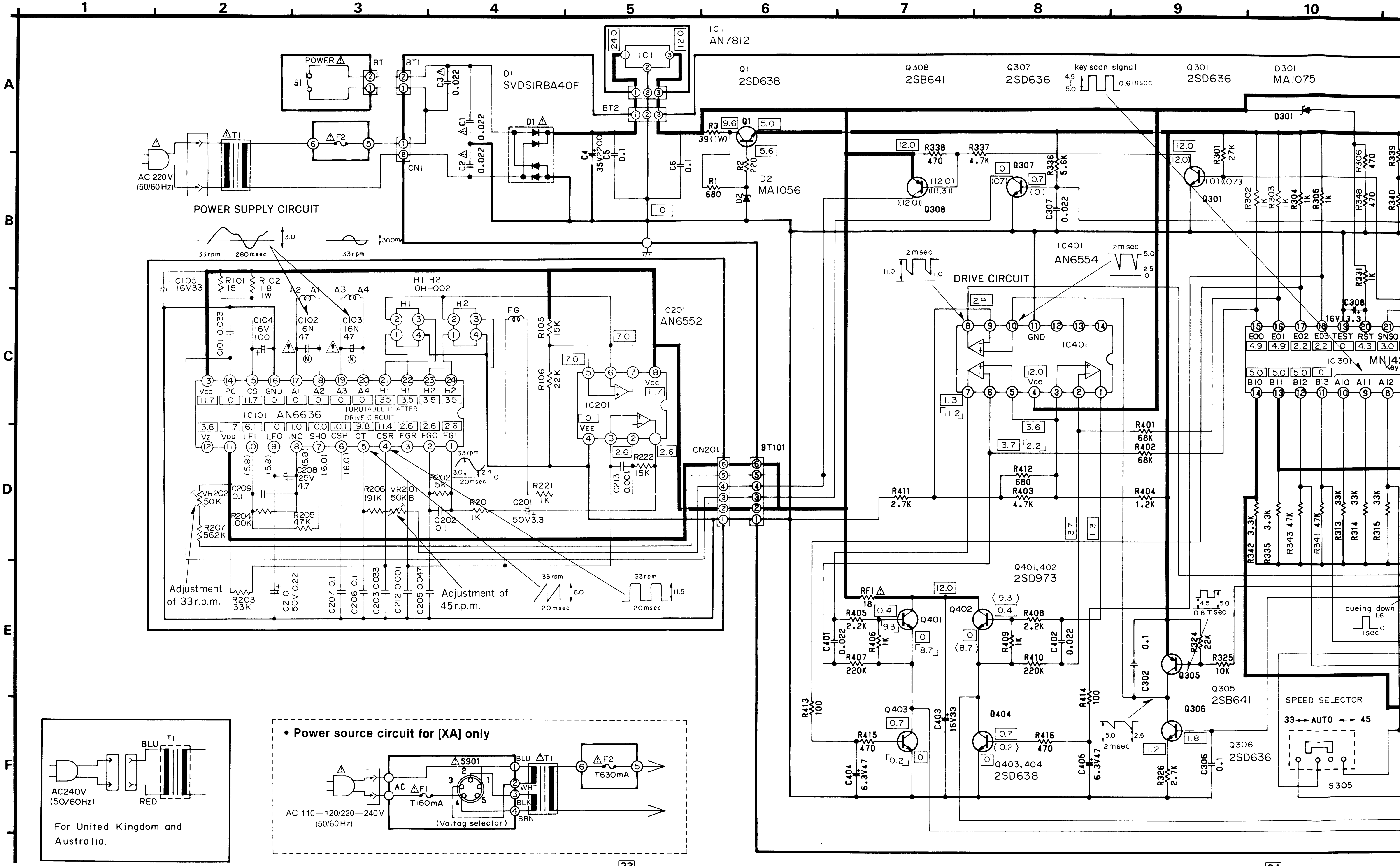
▨ Ground (Earth) lines

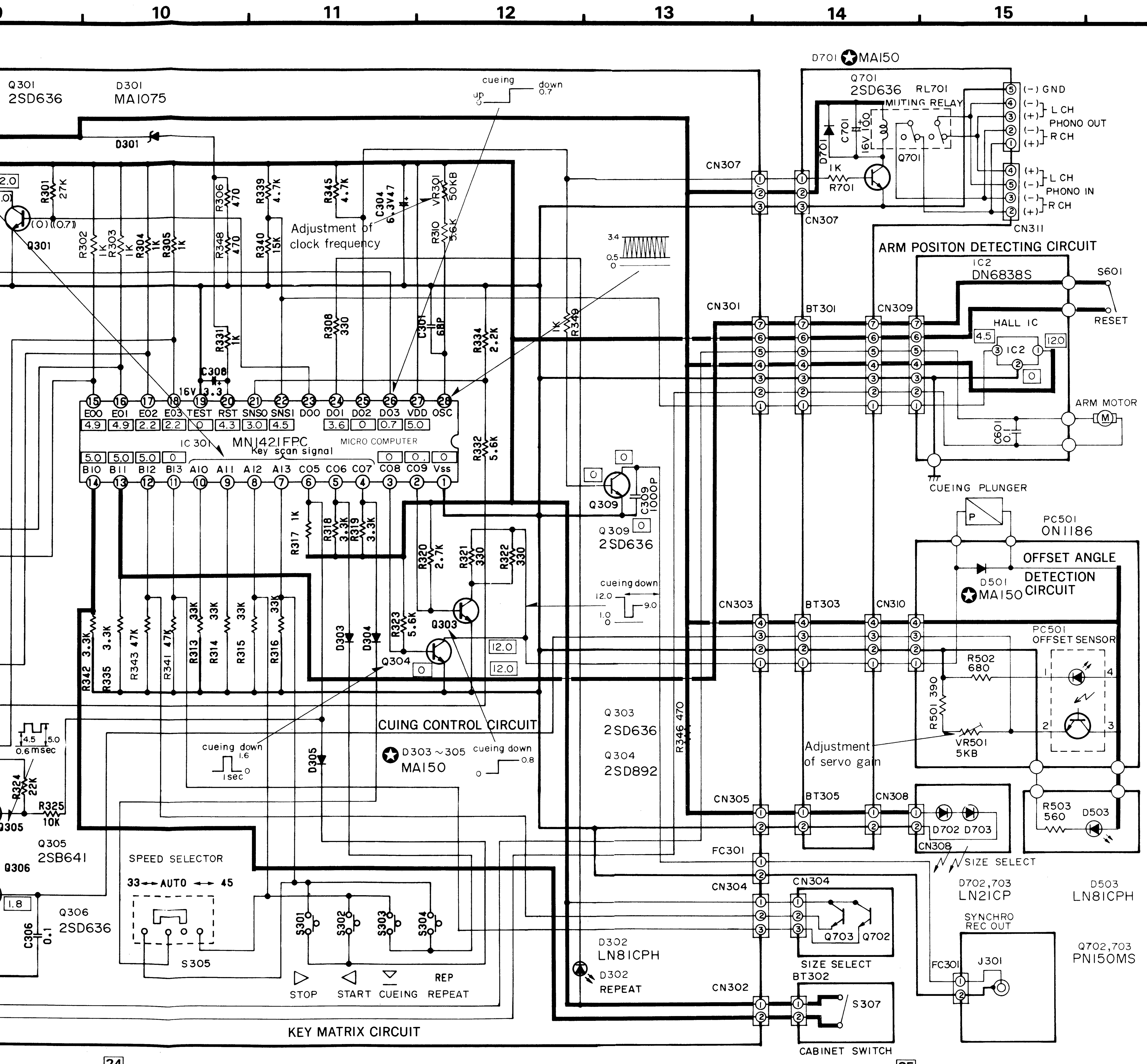

REPEAT
(Repeat indicator)
CUEING
STOP
SPEED SELECTOR
START
S304
S303
S301
S305
S302
33 ⟺ AUTO ⟺ 45
SYNCHRO-REC JACK
J301
FC301
FF SWITCH
S1
BT1
IC401
IC301
Q401
Q402
Q403
Q404
Q305
Q306
Q304
Q303
Q301
Q308
Q307
Q309
Q1
D302
D303
D301
D304
D305
D2
D1
VR301
CN301
CN304
CN305
CN302
CN303
CN307
CN1
BT2
BT101
FC301
LATOR IC
POWER TRANSFORMER
BLU
WHT
(T1)
F2 T630mA
AC LINE
PHONO OUTPUT TERMINAL
Ground
(L)
(R)
CARTRIDGE
R channel (+)
R channel (−)
L channel (+)
L channel (−)
Red
Green
White
Blue
CABINET SWITCH
S307
BT302
TONEARM POSITION INDICATOR
R503
D503
CUEING PLUNGER
Black
Orange
Yellow
Red
PC501
R502
R501
R500
D501
Q702
Q703
IN
OUT
CN304
RECORD SIZE SELECTION
D703
D702
CN308
RECORD SIZE SELECT SENSOR
BT305
CN309
CN308
BT304
RL701
CN311
CN310
BT303
D701
C701
R701
CN307
Q701
CONNECTOR CIRCUIT BOARD
ARM MOTOR
M
Blue
IC2
(S601)
REST SWITCH

• Power source circuit for [XA] only.


To CN1 ① terminal
To CN1 ② terminal
POWER TRANSFORMER
F2 T630mA
BLU
(T1)
F1 T160mA
S901
BLK
WHT
BRN
(AC input socket)
(Voltage selector)

SCHEMATIC DIAGRAM

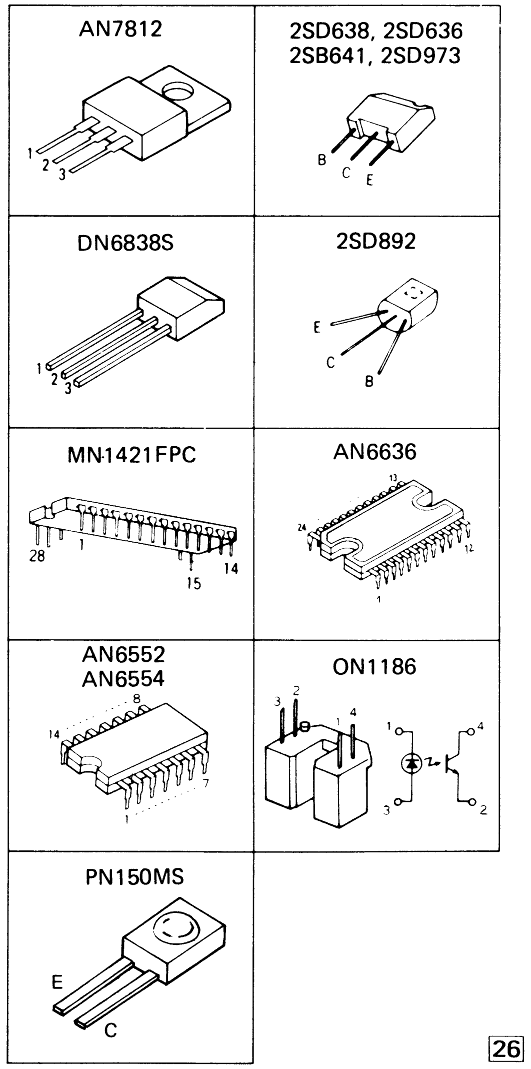

1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
POWER SUPPLY CIRCUIT
AC 220V (50/60Hz)
T1
F2
POWER
S1
BT1
CN1
C3 0.022
C1 0.022
C2 0.022
D1 SVDSIRBA40F
C4 35V2200
C5 0.1
IC1 AN7812
BT2
C6 0.1
Q1 2SD638
R3 39(1W)
R2 220
R1 680
D2 MA1056
Q308 2SB641
Q307 2SD636
key scan signal
0.6msec
Q301 2SD636
D301 MA1075
R338 470
R337 4.7K
R336 5.6K
C307 0.022
R301 27K
R302 1K
R303 1K
R304 1K
R305 1K
R306 470
R348 470
R339
R340
R331 1K
C308
33rpm
280msec
300mV
C105 16V33
R101 15
R102 1.8 1W
A2 A1 A3 A4
H1, H2 OH-002
H1
H2
FG
C101 0.033
C104 16V 100
C102 16N 47
C103 16N 47
R105 15K
R106 22K
IC201 AN6552
IC101 AN6636
TURUTABLE PLATTER DRIVE CIRCUIT
Vcc PC CS GND A1 A2 A3 A4 H1 H1 H2 H2
Vz VDD LFI LFO INC SHO CSH CT CSR FGR FGO FGI
C208 25V 4.7
C209 0.1
VR202 50K
R204 100K
R205 47K
R207 56.2K
R206 191K
VR201 50KB
R202 15K
R201 1K
C202 0.1
R221 1K
C201 50V3.3
C213 0.001
R222 15K
CN201
BT101
Adjustment of 33r.p.m.
R203 33K
C210 50V 0.22
C207 0.1
C206 0.1
C203 0.033
C212 0.001
C205 0.047
Adjustment of 45r.p.m.
20msec
DRIVE CIRCUIT
IC401 AN6554
2msec
GND
Vcc
R401 68K
R402 68K
R412 680
R403 4.7K
R411 2.7K
R404 1.2K
E00 E01 E02 E03 TEST RST SNSO
B10 B11 B12 B13 A10 A11 A12
IC301
MN14
Key
R342 3.3K
R335 3.3K
R343 47K
R341 47K
R313 33K
R314 33K
R315 33K
Q401, 402 2SD973
RF1 18
R405 2.2K
C401 0.022
R406 1K
R407 220K
Q401
Q402
R408 2.2K
R409 1K
C402 0.022
R410 220K
R413 100
Q403
R415 470
C404 6.3V47
C403 16V33
Q404
R416 470
Q403, 404 2SD638
R414 100
C405 6.3V47
C302 0.1
Q305
R324 22K
R325 10K
Q305 2SB641
Q306
R326 2.7K
C306 0.1
Q306 2SD636
cueing down
1sec
SPEED SELECTOR
33 ← AUTO → 45
S305
T1
BLU
RED
AC240V (50/60Hz)
For United Kingdom and Australia.
• Power source circuit for [XA] only
S901
AC
F1
T160mA
WHT
BLK
BRN
F2
T630mA
AC 110—120/220—240V (50/60Hz)
(Voltag selector)


10
11
12
13
14
15
16
17
18
19
Q301 2SD636
D301 MA1075
D701 ✪MA150
Q701 2SD636
RL701 MUTING RELAY
C701 16V 100
R701 1K
CN307
(−) GND
(−) L CH (+)
(−) R CH (+)
PHONO OUT
(+) L CH (−)
(+) R CH (−)
PHONO IN
CN311
ARM POSITON DETECTING CIRCUIT
IC2 DN6838S
S601
RESET
HALL IC
ARM MOTOR
C601
CUEING PLUNGER
PC501 ON1186
OFFSET ANGLE DETECTION CIRCUIT
D501 ✪MA150
PC501 OFFSET SENSOR
R502 680
R501 390
VR501 5KB
Adjustment of servo gain
R503 560
D503
D702 D703
SIZE SELECT
D702,703 LN21CP
D503 LN81CPH
SYNCHRO REC OUT
J301
Q702,703 PN150MS
CN301
BT301
CN309
CN303
BT303
CN310
CN305
BT305
CN308
FC301
CN304
Q703 Q702
BT302
S307
CABINET SWITCH
CN302
IC301 MN1421FPC MICRO COMPUTER
Key scan signal
EO0 EO1 EO2 EO3 TEST RST SNSO SNSI DO0 DO1 DO2 DO3 VDD OSC
BI0 BI1 BI2 BI3 AI0 AI1 AI2 AI3 CO5 CO6 CO7 CO8 CO9 Vss
Adjustment of clock frequency
VR301 50KB
C301 68P
Q309 2SD636
C309 1000P
CUING CONTROL CIRCUIT
Q303 2SD636
Q304 2SD892
✪ D303 ~ 305 MA150
cueing down
cueing up down
KEY MATRIX CIRCUIT
SPEED SELECTOR
33 AUTO 45
S305
S301 S302 S303 S304
STOP START CUEING REPEAT
D302 LN81CPH
D302 REPEAT
Q305 2SB641
Q306 2SD636
R325 10K
R324 22K
C306 0.1

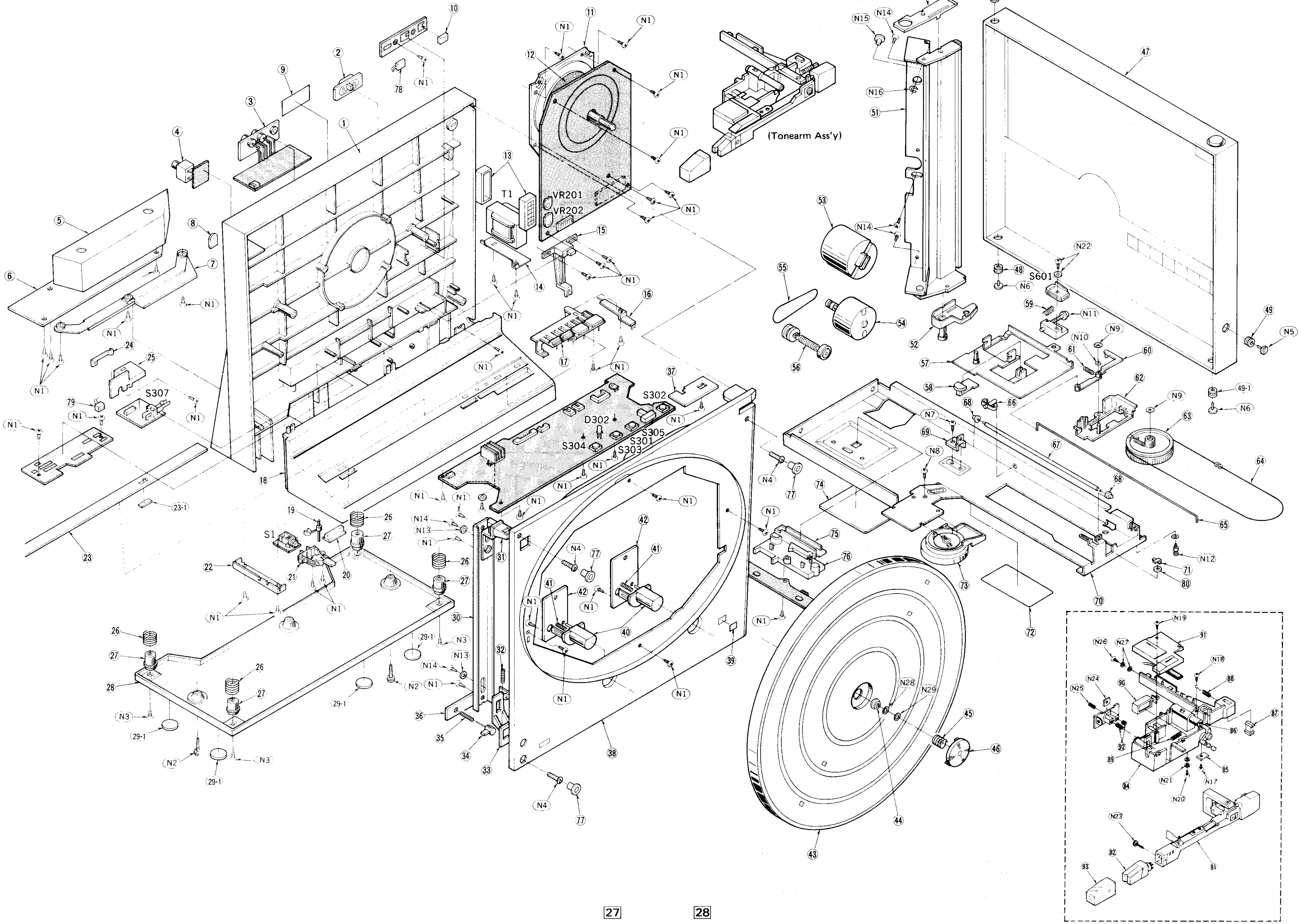
Notes:

1. **S1** : On/off (power) switch.
2. **S301** : Stop switch
3. **S302** : Start switch
4. **S303** : Cueing control switch
5. **S304** : Repeat switch
6. **S305** : Speed selector switch in "**auto**" position.
7. **S307** : Record detection switch.
   Presently a record is on turntable.
8. **S601** : Rest switch. Presently tonearm is on rest.
9. **S901** : Voltage selector in "**110-120V**" position.
10. The values in ☐ are the standard voltages measured by DC electro-voltmeter (high impedance) on the basis of chassis when the unit is in stop. So, some error might be included depending on the internal impedance of the measuring instrument and the set measured.
    - * (   ): voltage in 33rpm. (Measured without turntable)
    - * ((   )): voltage in 45rpm. (Measured without turntable)
    - * ⌜   ⌟: voltage when tonearm is in lead-in.
    - * 〈   〉: voltage when tonearm is in return.
11. ▬ : +B voltage lines.
12. Part No. with ✪ mark are not identical between regular part No. and repair part No. supplied.
    So, when placing an order for repair parts, use the part No. in the replacement parts list of repair parts.
13. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

- **Terminal guide of transistors, photo interrupters and IC's.**


AN7812
1 2 3
2SD638, 2SD636
2SB641, 2SD973
B C E
DN6838S
1 2 3
2SD892
E C B
MN1421FPC
28 1 14 15
AN6636
13 24 12 1
AN6552
AN6554
14 8 1 7
ON1186
1 2 3 4
PN150MS
E C

■ EXPLODED VIEW


(Tonearm Ass'y)
T1
VR201
VR202
S601
S302
D302
S305
S301
S304
S303
S307
S1
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
23-1
24
25
26
27
28
29-1
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40
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42
43
44
45
46
47
48
49
49-1
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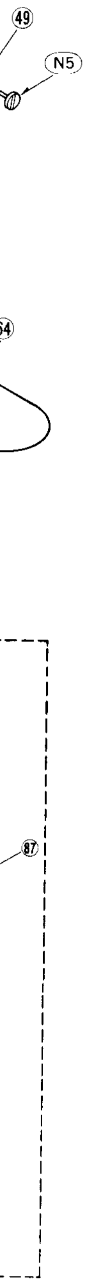
N1
N2
N3
N4
N5
N6
N7
N8
N9
N10
N11
N12
N13
N14
N15
N16
N17
N18
N19
N20
N21
N22
N23
N24
N25
N26
N27
N28
N29

■ REPLACEM

Notes: 1. Part numbers a
this part numbe
2. Important safet
Components in
important for s
use only manuf

Ref. No.		Part N
CABINET and CHASSIS		
1	○	SFACV05N
1	Ⓚ	SFACV05N2
2	(XL)only⚠	SFDJHSC0
2	(Other Areas)⚠	SFDJHSC0
3		SFDJV05N0
4		SFDJC06N0
5		SFUPV05N
6		SFUMV05N
7		SFUMV05N
8		SFUMV05N
9	(EK · XL)	SFNNV05G
9	(XA)	SFNNV05X
9	(E)(EC)	SFNNV05S
9	(Other Areas)	SFNNV05R
10		SFUMLIIN0
11		SFMZV05N
12		SFMGQ34N
13		SFGCV05N
14		SFUPV05N
15		SFKTV05N0
16		SFUMV05N
17		SFKTV05N0
18	○	SFUMV05N
18	Ⓚ	SFUMV05N
19		SFXJV05N0
20		SFKTV05N0
21		SFUMV05N
22		SFUPV05N
23	○	SFKKV05N
23	Ⓚ	SFKKV05N2
23−1		SFUPV05N1
24		SFQPC05N
25		SFUMV05N
26		SFQAV05N
27		SFGAV05N



■ REPLACEMENT PARTS LIST...Cabinet & Chassis Parts

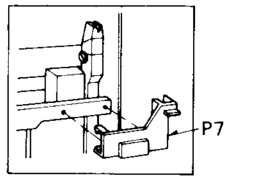
Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
   Components indentified by △ make have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ-marked parts are used for black type only, while ○-marked parts are for silver type only.
4. Parts other than Ⓚ and ○-marked are used for both black and silver types.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Ref. No.	Part No.	Description
CABINET and CHASSIS PARTS		
1 ○	SFACV05N01	Cabinet(Silver Type) (1)
1 Ⓚ	SFACV05N21	Cabinet(Black Type) (1)
2 〔XL〕only⚠	SFDJHSC0491	Socket, AC Power (1)
2 〔Other Areas〕⚠	SFDJHSC0498	Socket, AC Power (1)
3	SFDJV05N09E	Terminal, Phono Output (1)
4	SFDJC06N02	Jack, Synchro−rec (1)
5	SFUPV05N06	Weight (1)
6	SFUMV05N16	Cover, Weight (1)
7	SFUMV05N17	Cover, Socket, Jack & Tarminal (1)
8	SFUMV05N30	Cover (1)
9 〔EK・XL〕	SFNNV05G01	Name Plate (1)
9 〔XA〕	SFNNV05X01	Name Plate (1)
9 〔E〕〔EC〕	SFNNV05S01	Name Plate (1)
9 〔Other Areas〕	SFNNV05R01	Name Plate (1)
10	SFUMLIIN02	Holder, L. E. D. (2)
11	SFMZV05N03A	Stator Frame (1)
12	SFMGQ34N01	Cover, F. G. Coil (1)
13	SFGCV05N03	Cushion Rubber, Power Transformer (2)
14	SFUPV05N07	Plate, Power Transformer (1)
15	SFKTV05N03	Knob, Speed Selector (1)
16	SFUMV05N04	Lever, Speed Selector (1)
17	SFKTV05N02	Knob Ass'y, Key Switch (1)
18 ○	SFUMV05N01	Cover, Control knob(Silver Type) (1)
18 Ⓚ	SFUMV05N31	Cover, Control knob(Black Type) (1)
19	SFXJV05N01E	Joint Ass'y, On/off Switch (1)
20	SFKTV05N01	Knob, On/off Switch (1)
21	SFUMV05N18	SWitch Base, On/off Switch (1)
22	SFUPV05N08	Bracket, Cabinet & Cabinet Cover (2)
23 ○	SFKKV05N01	Surface Plate (Silve Type) (1)
23 Ⓚ	SFKKV05N21	Surface Plate (Black Type) (1)
23−1	SFUPV05N11	Filter, Surface Plate (1)
24	SFQPC05N01	Spring, Cabinet Switch (1)
25	SFUMV05N07	Cover, Cabinet Switch (1)
26	SFQAV05N03	Spring, Audio Insulator (4)
27	SFGAV05N01	Audio Insulator (4)
28	SFUPV05N09	Bottom Board (1)
29−1	SFGAV05N02	Cushion Rubber (4)
30	SFUPV05N03	Rod, Open/close Front Cabinet (1)
31	SFUMV05N02	Lever, Open/Close Front Cabinet (1)
32	SFQHV05N01	Spring, Open/close Front Cabinet (1)
33	SFUMV05N11	Lever, Open/close Front Cabinet (1)
34	SFUMV05N03	Shutter Open/close Front Cabinet (1)
35	SFQAV05N01	Spring, Shutter (1)
36	SFUMV05N27	Plate, Shutter (1)
37	SFUMV05N26	Plate, Main P. C. B. (1)
38	SFUMV05N10	Cover, Cabinet (1)
39	SFNZV05N03	Label, Speed Selector (1)
40	SFUMV05N13	Record Guide (2)
41	SFQAV05N02	Spring, Record Guide (2)
42	SFUMV05N14	Plate, Record. Guide (2)
43	SFTEV05N01E	Turntable Pllater Ass'y, (with Turntable MaT) (1)
44	SFUMV05N15	Cam, Turntable Pllater (1)
45	SFQAC06N01	Spring, E. P. Adaptor (1)
46	SFWEV05N01	E. P. Adaptor,45r. p. m. (1)
47 ○	SFADV05N01Z	Dust Cover Ass'y, (Silver Type) (1)
47 Ⓚ	SFADV05N21Z	Dust Cover Ass'y, (Black Type) (1)
48 ○	SFGCV05N01	Cushion Rubber, Dust Cover(Silver Type) (2)
48 Ⓚ	SFGCV05N21	Cushion Rubber, Dust Cover(Black Type) (2)
49 ○	SFGCV05N02	Cushion Rubber, Dust Cover(Silver Type) (1)
49 Ⓚ	SFGCV05N22	Cushion Rubber, Dust Cover(Black Type) (1)
49−1 ○	SFGCV05N04	Cushion Rubber, Dust Cover(Silver Type) (1)
49−1 Ⓚ	SFGCV05N24	Cushion Rubber. Dust Cover(Black Type) (1)
50	SFUMV05N05	Upper Cover, Hinge (1)
51	SFUPV05N05Z	Hinge (1)
52	SFUMV05N06	Lower Cover, Hinge (1)
53	SFUMC02N07	Cover, Tonearm Motor (1)
54	SFMHC02N01E	Motor Ass'y, Tonearm Drive (1)
55	SFGBC10−01	Belt, Tonearm Drive (1)
56	SFUML11R02A	Worm Gear Ass'y (1)
57	SFUPC02N10E	Plate Ass'y, Motor (1)
58	SFUMC02N10	Lope Guide (1)
59	SFQA913−01	Spring, Rest Switch Adjuster (1)
60	SFUMC02N05	Lever Ass'y, Rest Switch (1)
61	SFQHQ34N22	Spring, Rest Switch Lever (1)
62	SFUMC02N13	Plate Ass'y, Rest Switch (1)
63	SFUML11R03	Arm Drive Wheel (1)
64	SFUZC05N02E	Arm Drive Lope Ass'y (1)
65	SFUZC02N01	Rod, Rest Switch (1)
66	SFEZQ34N01	Clamper, Lead Wires (1)
67	SFXJC02N03	Guide Rail, Tonearm Drive (1)
68	SFGCC05N05	Cushion Rubber, Guide Rail (2)
69	SFUPC02N03	Bracket, Guide Rail (1)
70	SFUKV05N01E	Plate Ass'y, Tonearm (1)
71	SFUMC06N11	Cap, Pulley (1)
73	SFUMV05N12E	Stabilizer (1)
74	SFNZV05M01	Caution Label (1)
75	SFUMV05N09	Disk Size Selector (1)
76	SFUMV05N08	Spacer, Disc Size Selector (1)
77	SFXGV05N01	Cap, Cabinet Cover (3)
78	SFDJV05N11E	Connector Ass'y, 3P CN304 (1)
79	SFDJV05N01E	Connector Ass'y, 2P CN302 (1)
	SFDJV05N06E	Connector Ass'y, 3P (1)
	SFDJ109N13E	Connector Ass'y, 6P (1)
	SFDJV05N04E	Connector Ass'y 2P (1)
	SFDJV05N05E	Connector Ass'y 2P (1)
	SFDJV05N07E	Connector Ass'y 4P (1)
	SFDJV05N08E	Connector Ass'y 7P (1)
80	SFUMC05N22	Pulley (1)

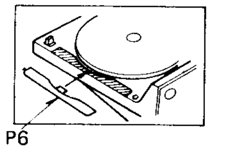
Ref. No.	Part No.	Description
TONEARM PARTS		
81	SFPAM0V501A	Tonearm Ass'y (1)
82	EPC−P24S	※Cartridge (1)
	EPS−24CS	※Stylus (1)
83	SFCNC02301	Cover, Stylus (1)
84	SFPKD00301R	Base Ass'y, Tonearm (1)
85	SFPZB00301	Plate (1)
86	SFPJU00301	Bracket, Guide Rail (1)
87	SFPGML1101	Rubber (1)
88	SFPSP0V501	Spring, Lead Wires (1)
89	SFPSP00504	Spring (1)
90	SFDZC05N01E	Cueing Plunger (1)
91	SFPCS0V501E	Cover, Tonearm Position Indicator (1)
92	SFPCS00302	Spring (2)
SCREWS, WASHERS and CIRCLIPS		
N1 S	XTV3+10BFN	Screw (44)
N2 S	SFXGD20−01	Screw (2)
N3 S	XTV3+10GFYR	Screw (3)
N4 S	XTV3+14BFN	Screw (3)
N5 ○	SFXGV05N03	Screw (Silver) (1)
N5 Ⓚ	SFXGV05N06	Screw (Black) (1)
N6	SFXGV05N02	Screw (3)
N7 S	XTV3+6BFN	Screw (1)
N8 S	XTV3+8B	Screw (1)
N9	CSTW3	Washer (2)
N10 S	XWE3	Washer (1)
N11	SFXGV05N01	Screw (1)
N12	SFXWC10−03	Screw (1)
N13 S	XWE3	Washer (2)
N14	XTW3+10Q	Screw (4)
N15	SFXJV05N03	Screw (1)
N16	SFXW130−01	Washer (1)
N17 S	XTN2+4B	Screw (1)
N18 S	XTN3+8BFZ	Screw (1)
N19 S	XTN26+6BFZ	Screw (1)
N20 S	XSN2+4	Screw (1)
N21 S	XWA2B	Washer (1)
N22	XTN16+10G	Screw (1)
N23	SFPEV00502	Screw (1)
N24	SFXN623−1	Nut (1)
N25	XXE3D10FZS	Screw (1)
N26 S	XSN3+12S	Screw (1)
N27 S	XWA3B	Washer (1)
N28	SFXWV05N02	Washer (1)
N29 S	XUC6FT	Washer (1)
ACCESSORIES		
A1 〔EK〕	SFNUV05G01	Instruction Book (1)
A1 〔EG〕	SFNUV05R01	Instruction Book (1)
A1 〔EF〕	SFNUV05F01	Instruction Book (1)
A1 〔EI〕	SFNUV05I01	instruction Book (1)
A1 〔XA〕	SFNUV05X01	Instruction Book (1)
A1 〔Other Areas〕	SFNUV05S01	Instruction Book (1)
A2	SFDHC05N01	Phono Cord (1)
A3	SFDLC05N01	Ground Wire (1)
A4 〔XL〕S⚠	RJA26Z	AC Cord (1)
A4 〔EK〕S⚠	RJA43Z	AC Cord (1)
A4 〔XA〕S⚠	QFC1103	AC Cord (1)
A4 〔Other Areas〕 S⚠	RJA20Z	AC Cord (1)
PACKING PARTS		
P1 〔EF〕○	SFHPV05C01	Carton Box, (Silver Type) (1)
P1 〔EF〕Ⓚ	SFHPV05C21	Carton Box, (Black Type) (1)
P1 〔Other Areas〕○	SFHPV05M01	Carton Box, (Silver Type) (1)
P1 〔Other Areas〕Ⓚ	SFHPV05M21	Carton Box, (Black Type) (1)
P2	SFHHV05N01	Pad, Left (1)
P3	SFHHV05N02	Pad, Right (1)
P4	SFHKV05N02	Clamper, Turntable Platter (2)
P5	XSN4+70FYBS	Screw, Clamper (2)
P6	SFHSV05N01	Spacer, Dust Cover (1)
P7	SFHKV05N01	Spacer, Tonearn (1)
P8	SFYH52×60	Polyethylene Bag, Cord (1)
P9	SFYH17×16	Polyethylene Bag, Unit (1)

■ PACKINGS

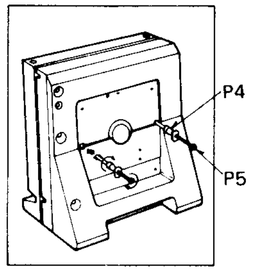
1. Open the cabinet and fit the spacer for tonearm protection in place.



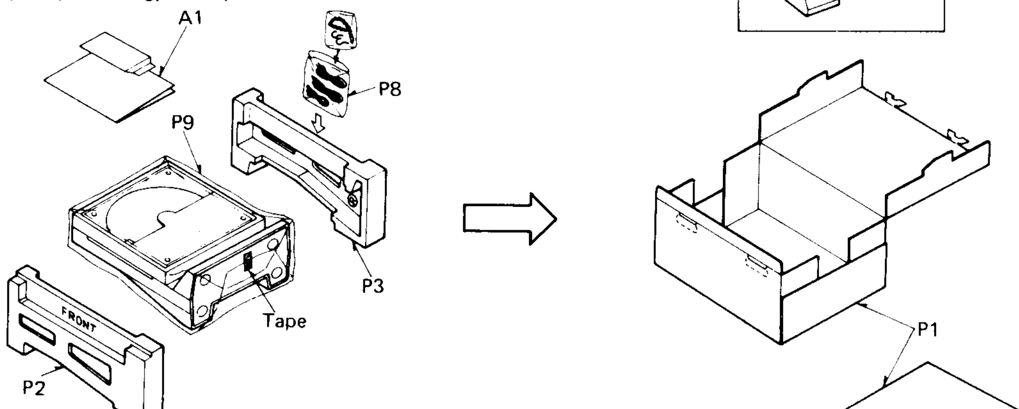
2. Fit the dust cover spacer.



3. Fit the turntable clamper.

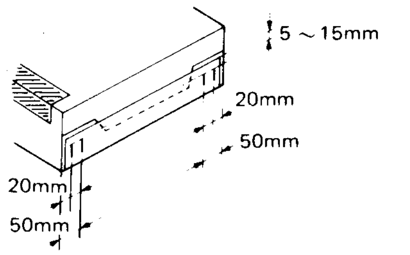


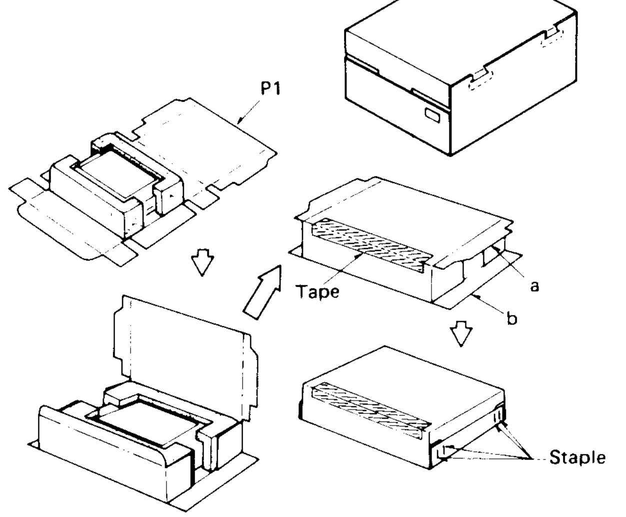
4. Put the set into the polyethylene bag, then pack it as shown below.



5. Plase the unit (with cushions attached) as illustrated.
6. Fold the flaps according to the line marks.
7. Seal the top with adhesive tape.
   *Use gum tape or adhesive cloth tape of 50 mm wide at least.
8. For the edges, first fold the flap "a" and then flap "b", and staple. Remember to staple only flap "b". (Use 15 or 16 mm staple)

* Stapling positions are shown below.





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